PB81-177461

Preliminary Evaluation of North Carolina's Program to Regulate Air Pollution from Stationary Sources

Booz-Allen and Hamilton, Inc.
Bethesda, MD

Prepared for

Council on Environmental Quality
Washington, DC

1 Jun 79

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE

1. REPORT NO.

2.

3. Recipient's Accession No.
PB81 177461

4. Title and Subtitle
Preliminary Evaluation of North Carolina's Program To Regulate Air Pollution from Stationary Sources

5. Report Date
June 1, 1979

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Organization Name and Address
Booz Allen
4330 East-West Highway
Bethesda, Md. 20014

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C) EQ8AC015
(G)

12. Sponsoring Organization Name and Address
Council on Environmental Quality, 722 Jackson Pl. NW, Washington, DC 20006, and U.S. Environmental Protection Agency, 401 M St. SW, Washington, DC 20460

13. Type of Report & Period Covered
final, Task I

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

CEQ and EPA sponsored five studies examining the response of sources to the regulatory approach to controlling air pollution, with emphasis on the post-compliance emissions history. The study areas are: North Carolina (3 vols), Houston (3 vols), San Diego (3 vols), Chicago (3 vols), and New Jersey (2 vols).

North Carolina's

This final report on Task I describes and evaluates the State's regulatory requirements, procedures, and programs.

17. Document Analysis a. Descriptors

air pollution control
regulation
North Carolina

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

i

18. Availability Statement
NTIS

19. Security Class (This Report)

20. Security Class (This Page)

21. No. of Pages
116

22. Price

(See ANSI-Z39.18)

See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

PB81-177461

CONTRACT NO. EQ8AC015

FINAL REPORT

Preliminary Evaluation of North Carolina's Program to Regulate Air Pollution From Stationary Sources

JUNE 1, 1979

PREPARED FOR

PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY

OFFICE OF PLANNING AND
EVALUATION, U.S. ENVIRONMENTAL PROTECTION AGENCY

BOOZ
ALLEN

pedco

4330 EAST-WEST HIGHWAY
BETHESDA, MARYLAND 20014
301-951-2200

CINCINNATI, OHIO

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

TABLE OF CONTENTS

Page Number

I. EXECUTIVE SUMMARY I-1

1. Overview of Air Pollution Control I-1
2. Requirements Imposed on Stationary Sources I-2
3. Precompliance and Postcompliance Programs I-3
4. Principal Findings I-6

II. INTRODUCTION II-1

III. OVERVIEW OF AIR POLLUTION CONTROL III-1

1. Air Pollution Control at the State Level III-1
2. Air Pollution Control at the Local Level III-18
3. Economic Incentives III-20

IV. REQUIREMENTS IMPOSED ON INDUSTRIAL POINT SOURCES IV-1

1. Registration Procedures IV-1
2. Emission Controls IV-8
3. Monitoring and Reporting IV-12
4. Permitting Requirements IV-14

V. PRECOMPLIANCE AND POSTCOMPLIANCE PROGRAMS V-1

1. Precompliance Programs V-1
2. Postcompliance Programs V-18

Page Number

VI. PRINCIPAL FINDINGS VI-1

1. General Findings VI-1
2. Precompliance Program Findings VI-4
3. Postcompliance Program Findings VI-7

APPENDIX

LIST OF TABLES

		Page Number
III-1	Authorities and Responsibilities of Environmental Management Commission and Department of Natural Resources and Community Development	III-8
III-2	Total Manpower Resources	III-9
III-3	Professional Manpower Resources	III-10
III-4	Air Quality Salaries July 1, 1970-July 1, 1979	III-12
III-5	Overview of Recordkeeping Practices	III-15
IV-1	Summary of North Carolina Regulations for Stationary Sources	IV-2
IV-2	North Carolina SO_2 Emission Standards	IV-9
IV-3	Visible Emission Requirements	IV-11
IV-4	North Carolina Source Monitoring Requirements	IV-13
V-1	Actual Activity Levels 1975-1978	V-2
V-2	Summary of Permit Program	V-10
V-3	Permit Activity Levels 1971-1978	V-12
V-4	Permit Program Resources Fiscal Years 1977-1979	V-16
V-5	Complaint Investigations	V-26
V-6	Monitoring Program Activities Fiscal Years 1977, 1978, 1978	V-28
V-7	Inspection Activities 1973-1978	V-29

		Page Number
V-8	Violations for Which Regional Inspectors Recommended Panalties	V-35
V-9	Enforcement Mechanisms: Frequency of Use FY 1975-1978	V-39
V-10	Overview of SOC Activity	V-41
V-11	Time Frame for Civil Penalties	V-46
V-12	Final Action on Cases Referred to Enforcement	V-48
V-13	Enforcement Resources of Air Quality Section, Fiscal Years 1977, 1978, 1979	V-49

LIST OF FIGURES

		Page Number
III-1	Organization of Department of Natural Resources and Community Development Prior to September 1, 1978	III-2
III-2	Organization of Division of Environmental Management Prior to September 1, 1978	III-4
III-3	Organization of Air Quality Section	III-5
III-4	Organization of Division of Environmental Management After September 1, 1978	III-6
III-5	Budget Resources FY 1970-1979	III-13
V-1	Process for Construction and Operating Permits	V-14
V-2	Source Testing Procedures for Demonstration of Compliance	V-20
V-3	Permit Renewal Procedures	V-31
V-4	Procedures for Appealing Permit or Permit Renewal Decisions	V-33
V-5	Source-Agency Negotiation of Special Orders by Consent (SOCs)	V-42
V-6	Civil Penalty Process	V-45

I. EXECUTIVE SUMMARY

Booz, Allen's assignment for the President's Council on Environmental Quality (CEQ) and the United States Environmental Protection Agency (EPA) is to evaluate air pollution control programs administered by the State of North Carolina. This final report on Task I provides a description and evaluation of the State's regulatory requirements, procedures, and programs. A definitive evaluation of the effectiveness of North Carolina in promoting continuing compliance must await the completion of the investigation of the performance of a sample of sources in Task II. The data used to prepare this report were published documents such as the State Implementation Plan (SIP) and annual program plans as well as interviews with staff members from EPA Region IV, the North Carolina Division of Environmental Management, and the North Carolina Attorney General's Office. This summary of the report is divided into four parts:

- Overview of air pollution control in North Carolina
- Requirements imposed on stationary sources
- Precompliance and postcompliance programs
- Principal findings.

1. OVERVIEW OF AIR POLLUTION CONTROL

The North Carolina Water and Air Resources Act, as amended, vested the responsibility and authority for the administration of air pollution control in the Department of Natural Resources and Community Development (DNRCD) and established an Environmental Management Commission (EMC). A diagram of the DNRCD organization is in Chapter III. The Secretary of DNRCD together with the EMC members has responsibility for setting overall policies. Other EMC responsibilities include rulemaking, permit and special order approval, and appeal functions. EMC, as authorized by statute, has delegated most program development and administration functions to the Division of Environmental Management of the DNRCD. Between 1971 and 1978, within the DNRCD, an Air Quality Section of the Division of Environmental Management (DEM) had responsibility for the day-to-day administration of control strategy planning, permitting surveillance/

monitoring, and enforcement programs. On enforcement, the Air Quality Section interacted with the Office of Enforcement and the Office of the Attorney General. The Laboratory Section of the DEM conducted laboratory analyses and special studies for the Air Quality Section. As of September 1, 1978, the DEM has reorganized the administration of air pollution control programs.

The DNRCD has seven regional offices, each administered by a manager accountable to the DNRCD Secretary. Environmental engineers and engineering technicians carry out the various air pollution control programs including ambient monitoring, annual compliance inspections, visible emissions observations, investigation of complaints, and initiation of enforcement actions.

Under the statute, local governments are authorized to establish and administer air pollution control programs with the approval of the EMC. Presently, there are three programs covering four counties which are fully certified and are the recipients of Federal funds. Five counties administer partial, non-Federally funded programs. These partially certified programs cover visible emissions and open burning. In all cases, the state supervises the local programs, primarily through meetings with these agencies every other month. The state is prepared to assume and has assumed jurisdiction when local programs are not administered properly or are discontinued.

2. REQUIREMENTS IMPOSED ON STATIONARY SOURCES

Based on an assessment of the state's air quality and the preparation and revision of an emissions inventory, North Carolina has adopted an overall strategy for controlling pollutants from all sources. Air pollution from stationary sources is controlled through a combination of ambient and emissions standards together with point source registration and permitting requirements. The state's overall policy for fostering initial and continuing compliance with emissions limitations is to pursue all avenues of voluntary cooperation prior to embarking on an aggressive enforcement path. Therefore, prior to 1975, the EMC approved temporary permits allowing the continuation of excess emissions, provided the source pledged in writing to proceed with the timely installation of required control measures. Subsequent to 1975, the EMC adopted a postattainment strategy which in essence replaced temporary permits with special orders by consent (SOC). Like the temporary permits, the SOC's specify interim steps and dates for completing those steps.

3. PRECOMPLIANCE AND POSTCOMPLIANCE PROGRAMS

The regulatory process can be defined in terms of the following four phases:

- Pre-permitting: Prior to the implementation of the Clean Air Act (CAA) of 1970
- Permit preparation: State development of enforceable emissions limits and imposition of limits on sources consistent with the CAA of 1970
- Construction: Source adoption of required controls
- Continuing compliance: Source operation and maintenance at required control levels.

The first three phases are discussed together as precompliance programs and the fourth phase consists of postcompliance programs.

(1) Precompliance Programs

Programs covered in this section include emissions inventory development, emission standard development, control strategy testing, permit preparation, and construction surveillance and monitoring. While the state has had water pollution control responsibilities since 1951, it did not institute an air pollution control program until July 1, 1967. At that time, the Board of Water Resources became the Department of Water and Air Resources with responsibility for administering air pollution control programs. This Department was responsible for surveying the air quality control regions, preparing the initial emissions inventory, submitting the 1971 SIP, and detecting open burning and visible emission violations. It is the predecessor of the present Division of Environmental Management.

1. Emission Inventory Development

Between 1968 and 1971, North Carolina constructed a county-by-county inventory based on gross estimates of mobile and area sources and a mail survey of point sources listed in the North Carolina Manufacturing Index. The inventory was inadequate, however, because no follow-ups were conducted with nonrespondents. Subsequent updates included surveys of a larger number of sources, utilized follow-ups, consisted of more detailed questions, and used more detailed mobile and area source data.

2. Emission Standard Development

In response to the Clean Air Act Amendments of 1970, the Department of Water and Air Resources had to obtain authority to promulgate new emission control regulations, issue permits, and conduct inspections. Subsequent to the enactment of this legislation in 1971, the agency drafted the emission regulations for sulfur oxides, particulates, hydrocarbons, and nitrogen oxides. Previously, in 1970, it had promulgated visible emission and open burning regulations.

3. Control Strategy Testing

In testing its control strategy, the agency designated the Metropolitan Charlotte Interstate Air Quality Control Region as the "example region." With respect to the SO_2 and particulate control strategy, Research Triangle Institute conducted air quality modelling for the state to demonstrate the strategy's adequacy to attain and maintain national standards. For carbon monoxide and nitrogen oxides, air quality measurements showed compliance with the ambient standards and no need for a control strategy. Measurements showed, however, a need for a control strategy for photochemical oxidants, including the need for a hydrocarbon regulation.

4. Permit Preparation

Figure V-1 in Chapter V shows the procedures used to review permit applications. The state grants only a single permit covering both construction and operation and since 1973 both existing and new sources have been subject to the permitting requirement. As of July 1, 1978 all 931 known major sources in the state had received permits. Of the 11,444 known minor sources, only about 6000 are subject to the permitting regulation and of these only one third (2000) have applied for and received permits.

5. Surveillance and Monitoring

The agency uses two different precompliance surveillance methods. For sources on compliance schedules, regional staff members track the sources' progress in meeting increments. For sources which have received final permits, the agency conducts no formal surveillance except for participating in the demonstration of compliance 60-90 days after operations commence.

(2) Postcompliance Programs

The principal activities in this phase include demonstration of compliance, surveillance and monitoring, and enforcement. Each is summarized briefly.

1. Demonstration of Compliance

A source must demonstrate compliance applicable emissions or equipment standards 60-90 days after commencing operation. All sources are subject to an agency-conducted engineering evaluation to ascertain that process characteristics and emission controls are in accordance with the permit. In some cases, the agency also conducts a visible emission evaluation. In other cases, the source must conduct a source test. If the agency is dissatisfied with the source test report which the source submits, it may conduct its own retest. These mechanisms for initial compliance demonstration are described in detail in Chapter V.

2. Surveillance and Monitoring

In order to ascertain continuing compliance, the regional staffs can utilize the methods described above for compliance demonstration. Typically, based on experience, each regional office develops a surveillance strategy at the beginning of the fiscal year. The strategy consists of an inspection schedule and recommendations for sources to be subject to an agency-conducted source tests. In addition, frequent visible emissions observations are made. The agency also conducts fuel analysis, complaint inspections, and follow-up inspections after the detection of violations.

3. Enforcement

The enforcement policy consists of pursuing all avenues of voluntary cooperation before assessing any penalties or sanctions. Enforcement actions are initiated at the discretion of the regional engineers. Typically, the regional engineer will solicit control strategy plans from a source in noncompliance. Only when the source is recalcitrant in submitting such plans or persistently violates its SOC will the regional engineer recommend assessment of a civil penalty. As the discussion on enforcement in Chapter IV notes, such actions are rarely taken, and when they are, the final penalty assessed by the Director of the DEM is sometimes less than that recommended by both regional and headquarters staffs. Although permits can be revoked, none have been. However, occasionally permit renewal applications are disapproved if an inspection has shown a source to be in violation.

4. PRINCIPAL FINDINGS

Until the Task II analysis of source performance is completed, it will not be possible to evaluate the effectiveness of North Carolina's programs in terms of the extent to which sources have achieved and maintained emissions reductions. In the interim, it is possible to present some preliminary findings on the programs' critical strengths and potential problem areas.

(1) General Findings

Chapter VI of the report identifies three areas of particular strength in the North Carolina program as well as two categories of significant problems. The chapter notes that the EPA Region IV staff considers the North Carolina Program to be one of the best state programs in the region. The staff bases this assessment on the fact that the Air Quality Section has excellent working relationships with both EPA staffs and the staffs of local programs in North Carolina. The excellent working relationship with EPA involves obtaining EPA assistance and input on proposed SIP revisions, regulatory amendments, and SOC preparation. With respect to interaction with local programs, the Air Quality Section provides assistance on monitoring, permit preparation, and development of local regulations. In addition, the North Carolina officials have developed good rapport with sources partially as a result of the extensive technical assistance regional staffs provide. Finally, both headquarters and regional air programs staffs have extensive technical capability in methods of detecting violations and in assisting sources in developing control strategies.

These positive characteristics are offset by agency administrative problems. A major problem is the inadequacy of recordkeeping practices as described in Chapter III. In general, the files in both headquarters and regional offices are incomplete, inconsistent, and sometimes difficult to access. The lack of historical budget data and actual expenditure data by program element is one example of the problem. A second example is the absence of permit applications, permits, inspection reports, and other documents from many of the source files in headquarters. Chapter III illustrates how these and other recordkeeping activities are detrimental to agency decisionmaking.

A second set of administrative problems reflect the multi-layered structure of the air pollution control program. One example, cited by both EPA Region IV staff and the Air Quality staff, is that the EMC often approves orders after the source is supposed to have completed the schedule for compliance. A second example is the decentralized organization of enforcement activities which leaves the initiation of enforcement action up to each regional staff. A third example is that the autonomy of the regional offices provides potential for variations among regions in the operating definitions of compliance.

(2) Precompliance Program Assessment

This section of Chapter VI assesses five programs:

- Emissions inventory
- Emission standard development
- Control strategy testing
- Permit preparation
- Surveillance.

It notes that after some initial problems, the inventory updating appears to be effective. Similarly, the emission standards appear to be effective in that industry has mounted few challenges to them. The control strategy testing was characterized by the drawback typically found in many states: it used the example region approach, with the potential for regulatory overkill. However, that problem apparently has not arisen in North Carolina. The permit program, which since 1973 applies to new and exsiting sources, appears in general to be well organized and administered. However, as noted in Chapter V, two-thirds of the minor sources required to have permits do not yet have them. Finally, precompliance surveillance of sources on compliance schedules receives high priority.

(3) Postcompliance Programs

Chapter VI assesses the following programs:

- Demonstration of compliance
- Surveillance and monitoring
- Permit renewal
- Enforcement strategies.

The assessment concludes that the first three programs are well managed. All sources are subject to an agency conducted engineering evaluation inspection to demonstrate compliance. In addition, some sources are subject to a source test or visible emission evaluation. The agency uses these same techniques in its surveillance of continuing compliance. It supplements these with fuel analyses, agency conducted source tests, complaint investigations and follow-up inspections when violations are detected. One problem in an otherwise well-run program is that, as Chapter V shows, the agency does not inspect all of the approximately 12,000 sources each year, and only a small number of sources appear to be inspected more than once a year. Thus, at any given moment, the agency is likely to be unaware of the extent and duration of excessive emissions. The well run permit renewal program provides the agency with an additional opportunity to check on a sources' compliance. Sources not in compliance with the process conditions or control requirements in their permits do not receive renewals.

Evaluation of the enforcement program is much more difficult. First, it is important to note that enforcement responsibilities are highly decentralized. Initiation of enforcement actions is the responsibility of each regional staff. Both Air Quality Section unit chiefs and the separate Enforcement Office staff must approve the action. The Enforcement Office cannot take independent action. The DEM Director makes the final decisions on most actions. Despite this decentralized approach, both the region and headquarters staffs consistently appear to have implemented the EMC enforcement policy of encouraging voluntary compliance. In other words, rather than imposing fines on violators, the agency has provided technical assistance and issued special orders by consent with compliance schedules. Therefore, even though North Carolina does not often seek sanctions against violators, the agency successfully gets sources to cease violations whenever such violations are detected. Chapter V presents a detailed description of the use of available enforcement mechanisms.

II. INTRODUCTION

Direct regulation remains the principal means of controlling air pollution and attaining and maintaining National Ambient Air Quality Standards (NAAQS). Little empirical data exists, however, on either the public or private sector costs of direct regulation or the actual achievement and maintenance of emissions reduction. The United States Environmental Protection Agency (EPA) and the President's Council on Environmental Quality have requested Booz, Allen & Hamilton to conduct an evaluation of the State of North Carolina air pollution control program as part of a five-state study. The overall objectives of the project are to:

- Improve understanding of the costs and effectiveness of existing programs
- Improve Federal, state, and local programs to foster continuing compliance
- Provide the basis for a consideration of economic incentives.

The data collection effort to meet these objectives is divided into two phases: first, an examination of the regulatory process administered by state agencies; and, second, an examination of the emissions control performance of 20-30 industrial sources.

This report represents the completion of the first phase of data collection. Its purpose is twofold. First, it provides a review and preliminary evaluation of the existing state laws, regulations, and programs in North Carolina designed to ensure the control of air pollution form stationary sources. In other words, the report characterizes the state's regulatory requirements, procedures, and programs, defines the public cost of each program activity; and makes a preliminary assessment of critical strengths and weaknesses of the state programs. Second, the report lays the foundation for the analysis in Task 2 of source performance. In other words, this report results in a preliminary definition of the nature of the interaction between the source and the agency. It also defines the potential obstacles to assessing source performance and agency effectiveness. Continued data collection and analysis efforts will contribute to a refinement of the initial assessment of agency effectiveness.

The report focuses on air pollution control at the state level, that is, those programs administered by the Air Quality Section, Division of Environmental Management (DEM), North Carolina Department of Natural Resources and Community Development (DNRCD).[1] In addition, it examines the role of the DEM's Enforcement office and the Office of the State Attorney General. It also described DNRCD's interaction with other state and local agencies. The programs examined fall into the following four regulatory phases:

- Pre-permitting: The period prior to the implementation of the Clean Air Act of 1970
- Permit preparation: The period during which the state develops enforceable emissions limitations
- Construction: The phase during which the sources install the control equipment and processes necessary to meet emissions limits
- Continuing compliance: The phase during which the source is expected to remain in compliance.

These are discussed in terms of pre- and postcompliance programs.

The report provides historical perspective by describing significant regulatory and program changes which have occurred since the air pollution control program began in 1968. However, it does not address in detail the major reorganization of the DEM which was effective as of September 1, 1978. In this reorganization, the DEM's existing organization structure in terms of environmental media was replaced by a functional organization, and the Air Quality Section was abolished.

The information contained in this report was obtained primarily through in-depth interviews with staff members of the Air Quality Section and Enforcement Office of the Division of Environmental Management as well as the Attorney General's Office. Interview data from North Carolina was supplemented by interviews with EPA Region IV personnel and review of a variety of written documents such as the State Implementation Plan (SIP) and annual program plans.[2]

---

[1] Chapter III, Table III-1 distinguishes between the respective authorities and responsibilities of the DNRCD and the EMC.

[2] Appendix A lists the individuals interviewed and the interview dates.

The findings presented in this report must be interpreted in light of two constraints. The first constraint was the difficulty in obtaining sufficiently detailed data on program activity levels and costs. A significant initial assumption was that the Air Quality Section would be able to provide compiled and published data on budgets and actual expenditures by program element, staffing levels and turnover, planned versus actual activity levels, complaint investigations, and enforcement. In actuality, as Chapter III explains in detail, the program records are decentralized, inconsistent and incomplete, and data is difficult to retrieve in a form suitable for historical analysis. Specific data collection problems arose with respect to budget and expenditures and activity levels. For example, since EPA did not require it, the Air Quality Section neither prepared nor tracked its budget according to program elements or activity outputs. Rather, the budgets reflected direct cost items, that is, such items as salaries, equipment, travel, and publications. Furthermore, program managers were unable to estimate their budgets or expenditures. Weekly time sheets provided some indication of manhours spent per program element. However, data from the time sheets has not been compiled continuously on an historical basis, and for several years the time sheets appear to be missing. To circumvent this problem, Booz, Allen assembled total budget levels from air quality grant applications for FY 1970-1977 and worked with program plans to estimate program element costs for FY 1977-1979. Similar types of problems arose with respect to ascertaining historical activity levels. In some cases, the raw data was available but was not retrievable historically by year, requiring extensive file reviews.

A second constraint faced in developing Task I findings was the absence of information on source performance. For the purposes of this project, agency effectiveness is to be measured in terms of the attainment and maintenance of a specified level of reduction in stationary source emissions. The Task I report, however, reflects neither the data collected during Task II nor the data collected on the three other programs under investigation. Therefore, the findings in this report should be considered preliminary, subject to reassessment and refinement in the Task III final report.

The remainder of this report is organized as follows. It begins with an overview of air pollution control in the State of North Carolina. This overview first describeds the organiziation, authority,and responsibilities of state level programs. The overview concludes with a brief description of economic incentives. Following the overview is a chapter describing requirements imposed on point sources. The next chapter consists of a detailed discussion of specific programs. First, precompliance programs are discussed. These include the pre-1971 North Carolina program, SIP development, permit preparation, and surveillance and monitoring during the construction stage. Second, a discussion of postcompliance programs covers the demonstration of compliance, continuing compliance surveillance and monitoring, and postattainment enforcement strategy. The report concludes with a presentation of preliminary findings on the strengths and weaknesses of North Carolina's programs for controlling stationary source emissions.

III. OVERVIEW OF AIR POLLUTION CONTROL

This chapter contains a description of the organization, authorities, and functions of both state and local air pollution control agencies. It also briefly describes some economic incentives available to the sources.

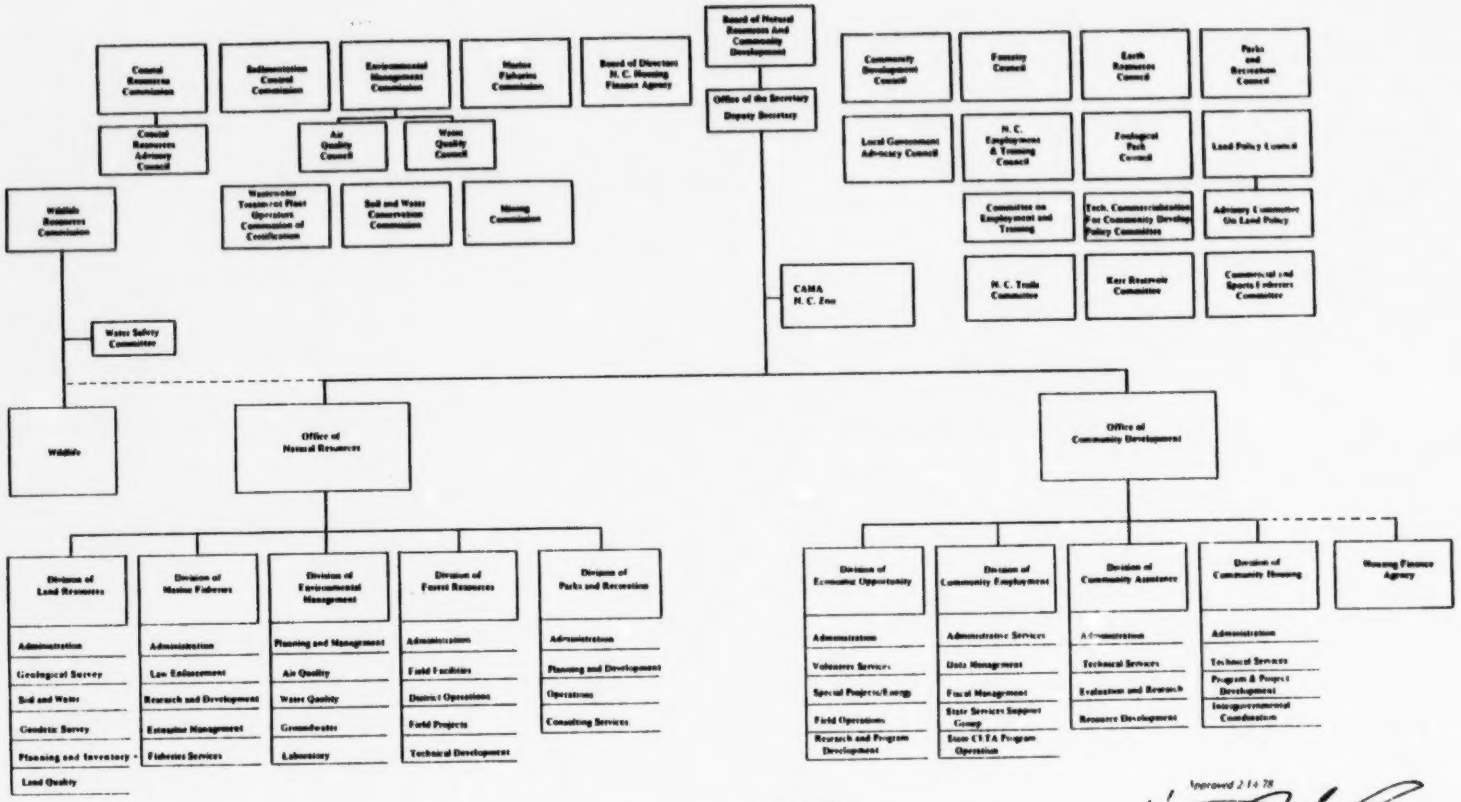
1. AIR POLLUTION CONTROL AT THE STATE LEVEL

This section addresses two points. First, it describes the organization and functions of those divisions and sections within the Department of Natural Resources and Community Development (DNRCD) and the Attorney General's Office responsible for air pollution control. Second, it summarizes the ambient and emissions standards as well as other regulatory requirements applicable to stationary sources. The emphasis is on the control strategy, standards, and regulations in force now, since Chapter IV on precompliance and postcompliance programs provides an overview of the significant changes that have occurred since the air pollution control program began in 1968.

(1) Organization of State Level Agencies

Responsibility for the development and administration of air pollution control programs is divided between the Environmental Management Commission (EMC) and the Department of Natural Resources and Community Development (DNRCD). Figure III-1, on the following page, depicts the current organizational relationship between the EMC and DNRCD as well as the structure of the DNRCD prior to September 1, 1978. The Secretary of the DNRCD and the EMC members share responsibility for the adoption of overall air pollution control policies. The EMC also exercises both quasi-judicial (i.e., permit and penalty appeals) and quasi-legislative (i.e., rulemaking) functions. In the latter, the EMC is advised by the Air Quality Council (AQC). Appointed by the Governor, the AQC includes among its members representatives of industry, health and medicine, scientific disciplines, and municipal and county governments.

FIGURE III-1
Organization of Department of Natural
Resources and Community Development
Prior to September 1, 1978


Board of Natural Resources And Community Development
Office of the Secretary
Deputy Secretary
Coastal Resources Commission
Coastal Resources Advisory Council
Sedimentation Control Commission
Environmental Management Commission
Air Quality Council
Water Quality Council
Marine Fisheries Commission
Board of Directors N. C. Housing Finance Agency
Wastewater Treatment Plant Operators Commission of Certification
Soil and Water Conservation Commission
Mining Commission
Wildlife Resources Commission
Water Safety Committee
Community Development Council
Forestry Council
Earth Resources Council
Parks and Recreation Council
Local Government Advocacy Council
N. C. Employment & Training Council
Zoological Park Council
Land Policy Council
Committee on Employment and Training
Tech. Commercialization For Community Develop. Policy Committee
Advisory Committee On Land Policy
N. C. Trails Committee
Kerr Reservoir Committee
Commercial and Sports Fisheries Committee
CAMA
N. C. Zoo
Wildlife
Office of Natural Resources
Office of Community Development
Division of Land Resources
Administration
Geological Survey
Soil and Water
Geodetic Survey
Planning and Inventory
Land Quality
Division of Marine Fisheries
Administration
Law Enforcement
Research and Development
Estuarine Management
Fisheries Services
Division of Environmental Management
Planning and Management
Air Quality
Water Quality
Groundwater
Laboratory
Division of Forest Resources
Administration
Field Facilities
District Operations
Field Projects
Technical Development
Division of Parks and Recreation
Administration
Planning and Development
Operations
Consulting Services
Division of Economic Opportunity
Administration
Volunteer Services
Special Projects/Energy
Field Operations
Research and Program Development
Division of Community Employment
Administrative Services
Data Management
Fiscal Management
State Services Support Group
State CETA Program Operation
Division of Community Assistance
Administration
Technical Services
Evaluation and Research
Resource Development
Division of Community Housing
Administration
Technical Services
Program & Project Development
Intergovernmental Coordination
Housing Finance Agency

Regional Field Offices

Asheville • Fayetteville • Mooresville • Washington • Raleigh • Wilmington • Winston Salem

Approved 2 14 78

Secretary

Reproduced from
best available copy.

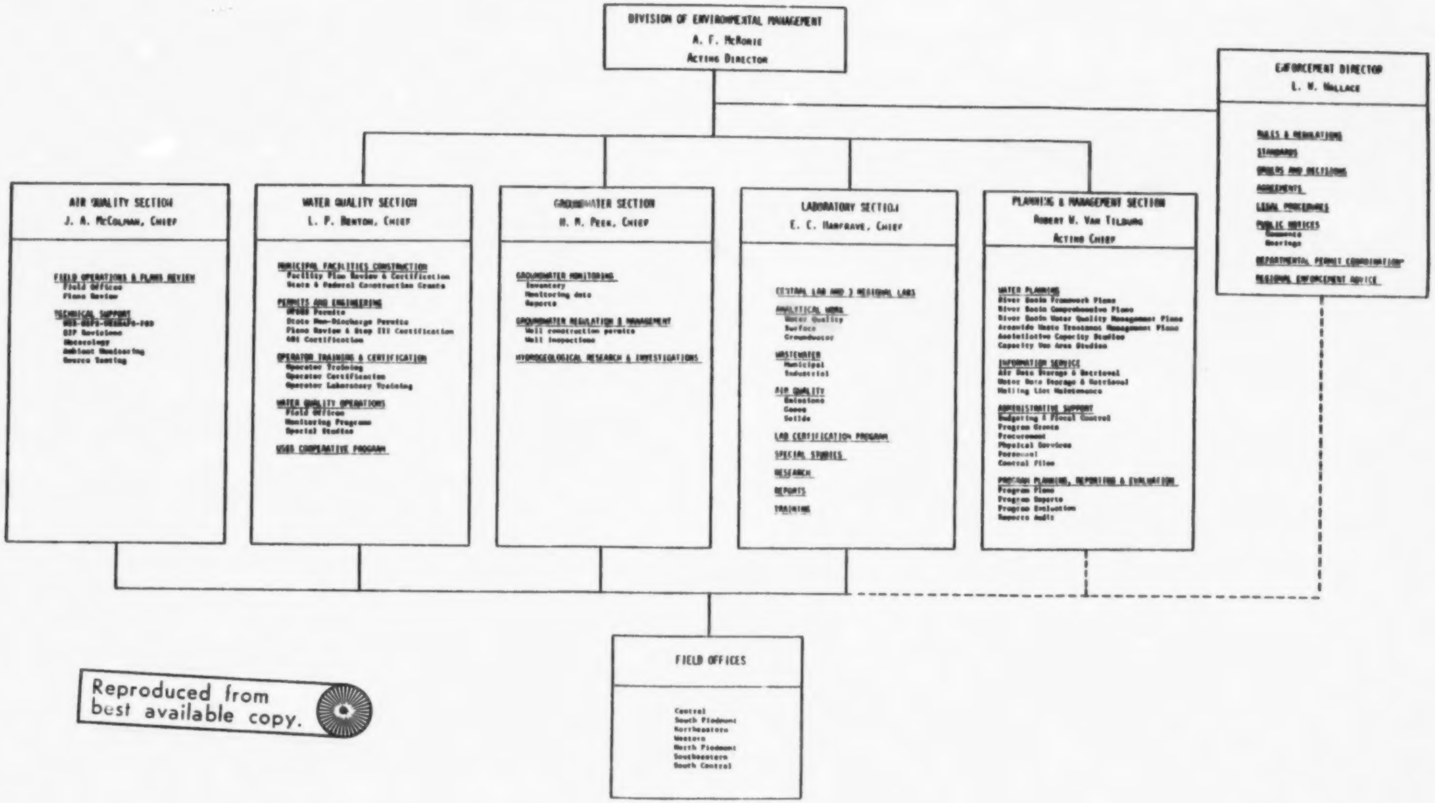
Within the DRNCD, the Division of Environmental Management (DEM) develops and administers the air quality programs in accordance with the policies and regulations promulgated by the EMC. Figure III-2 depicts the organization of the DEM prior to September 1, 1978. Organized until that time on an environmental media basis, the DEM was responsible for air and water quality programs, including approvals of permits, special orders by consent, and penalties. Within the DEM, the Air Quality Section (AQS) administered the programs by which statutory and regulatory requirements were implemented. Figure III-3 displays the AQS organization. The Laboratory Section, also within the DEM, provided air quality analysis and the Enforcement Office, relatively autonomous from the DEM, provided assistance in the development of regulations, standards, consent orders, and permits. Under the reorganization effective September 1, 1978, the DEM was restructured on a functional basis as shown in Figure III-4. While the DEM's overall responsibilities remained unchanged, the Air Quality Section was abolished and air quality program planning and administration was divided among several offices.

As shown in Figure III-4, the Department has seven regional offices, each of which is administered by a regional manager. Regional air quality engineers and engineering technicians carry out the air quality section's responsibilities relating to ambient monitoring, plans (permit) reviews, inspections, complaint investigations, and enforcement. Figure III-3 shows that prior to the reorganization, the regional air quality engineers were accountable to the Field Operations and Permits chief in Raleigh. Even with coordination by the field operations chief, however, regional staffs exercised considerable autonomy. Under the reorganization shown in Figure III-4, the regional air quality staffs are no longer directly responsible to an air quality staff member in Raleigh. Rather, they are accountable to the Assistant Director of Environmental Operations whose concerns include extensive water quality programs in addition to the air quality programs.

(2) Authority and Responsibilities

The North Carolina Water and Air Resources Act provides the EMC and DNRCD with all the necessary

FIGURE III-2
Organization of Division of
Environmental Management
Prior to September 1, 1978


DIVISION OF ENVIRONMENTAL MANAGEMENT
A. F. McRorie
Acting Director
AIR QUALITY SECTION
J. A. McColman, Chief
FIELD OPERATIONS & PLANS REVIEW
Field Offices
Plans Review
TECHNICAL SUPPORT
NSR-NSPS-NESHAPS-PSD
SIP Revisions
Meteorology
Ambient Monitoring
Source Testing
WATER QUALITY SECTION
L. P. Benton, Chief
MUNICIPAL FACILITIES CONSTRUCTION
Facility Plan Review & Certification
State & Federal Construction Grants
PERMITS AND ENGINEERING
NPDES Permits
State Non-Discharge Permits
Plans Review & Step III Certification
401 Certification
OPERATOR TRAINING & CERTIFICATION
Operator Training
Operator Certification
Operator Laboratory Training
WATER QUALITY OPERATIONS
Field Offices
Monitoring Programs
Special Studies
USGS COOPERATIVE PROGRAM
GROUNDWATER SECTION
H. M. Peek, Chief
GROUNDWATER MONITORING
Inventory
Monitoring data
Reports
GROUNDWATER REGULATION & MANAGEMENT
Well construction permits
Well inspections
HYDROGEOLOGICAL RESEARCH & INVESTIGATIONS
LABORATORY SECTION
E. C. Hargrave, Chief
CENTRAL LAB AND 3 REGIONAL LABS
ANALYTICAL WORK
Water Quality
Surface
Groundwater
WASTEWATER
Municipal
Industrial
AIR QUALITY
Emissions
Gases
Solids
LAB CERTIFICATION PROGRAM
SPECIAL STUDIES
RESEARCH
REPORTS
TRAINING
PLANNING & MANAGEMENT SECTION
Robert V. Van Tilburg
Acting Chief
WATER PLANNING
River Basin Framework Plans
River Basin Comprehensive Plans
River Basin Water Quality Management Plans
Areawide Waste Treatment Management Plans
Assimilative Capacity Studies
Capacity Use Area Studies
INFORMATION SERVICE
Air Data Storage & Retrieval
Water Data Storage & Retrieval
Mailing List Maintenance
ADMINISTRATIVE SUPPORT
Budgeting & Fiscal Control
Program Grants
Procurement
Physical Services
Personnel
Central Files
PROGRAM PLANNING, REPORTING & EVALUATION
Program Plans
Program Reports
Program Evaluation
Records Audit
ENFORCEMENT DIRECTOR
L. W. Wallace
RULES & REGULATIONS
STANDARDS
ORDERS AND DECISIONS
AGREEMENTS
LEGAL PROCEDURES
PUBLIC NOTICES
Comments
Hearings
DEPARTMENTAL PERMIT COORDINATION
REGIONAL ENFORCEMENT ADVICE
FIELD OFFICES
Central
South Piedmont
Northeastern
Western
North Piedmont
Southeastern
South Central

Reproduced from best available copy.

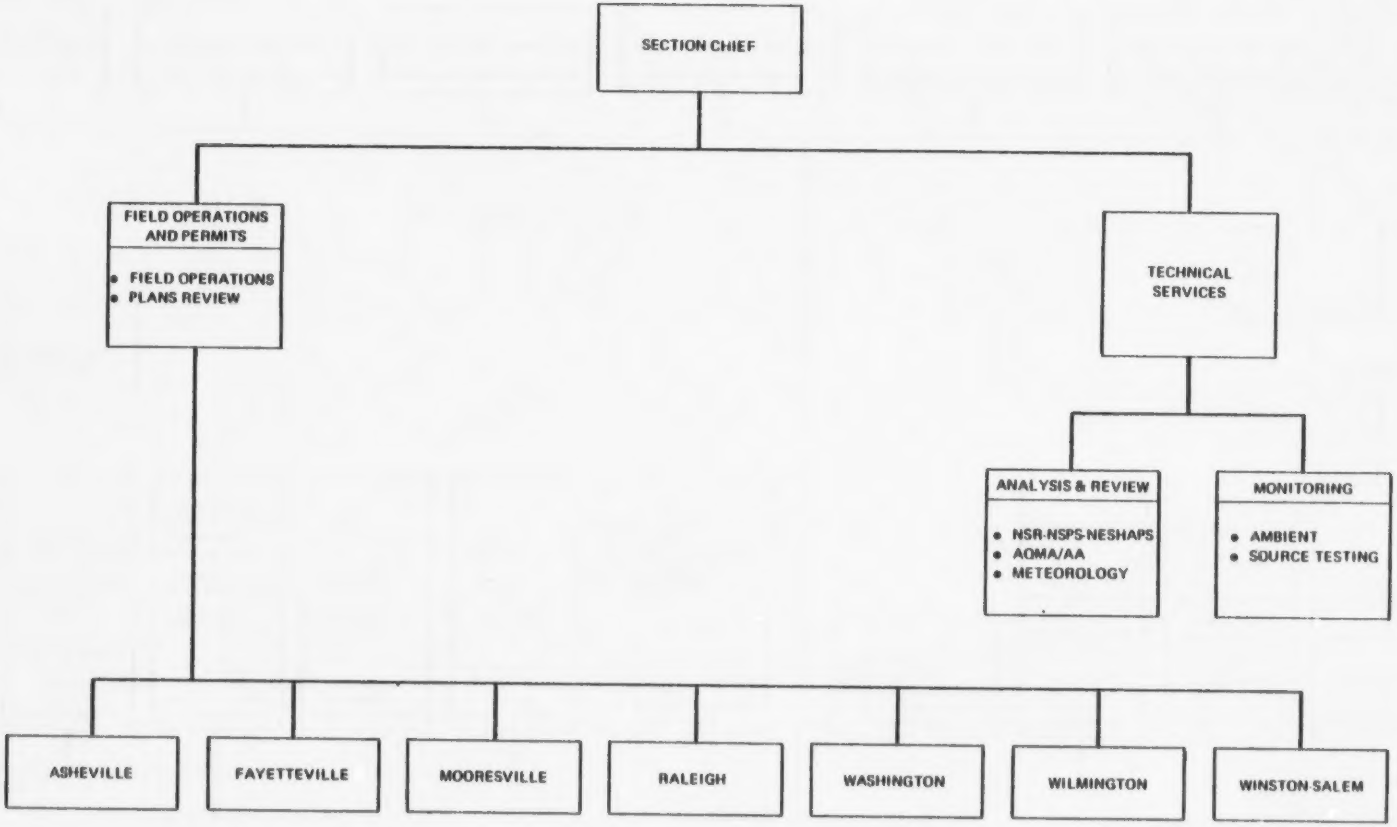

SECTION CHIEF
FIELD OPERATIONS AND PERMITS
• FIELD OPERATIONS
• PLANS REVIEW
TECHNICAL SERVICES
ANALYSIS & REVIEW
• NSR-NSPS-NESHAPS
• AQMA/AA
• METEOROLOGY
MONITORING
• AMBIENT
• SOURCE TESTING
ASHEVILLE
FAYETTEVILLE
MOORESVILLE
RALEIGH
WASHINGTON
WILMINGTON
WINSTON-SALEM

FIGURE III-3
Organization of Air Quality Section

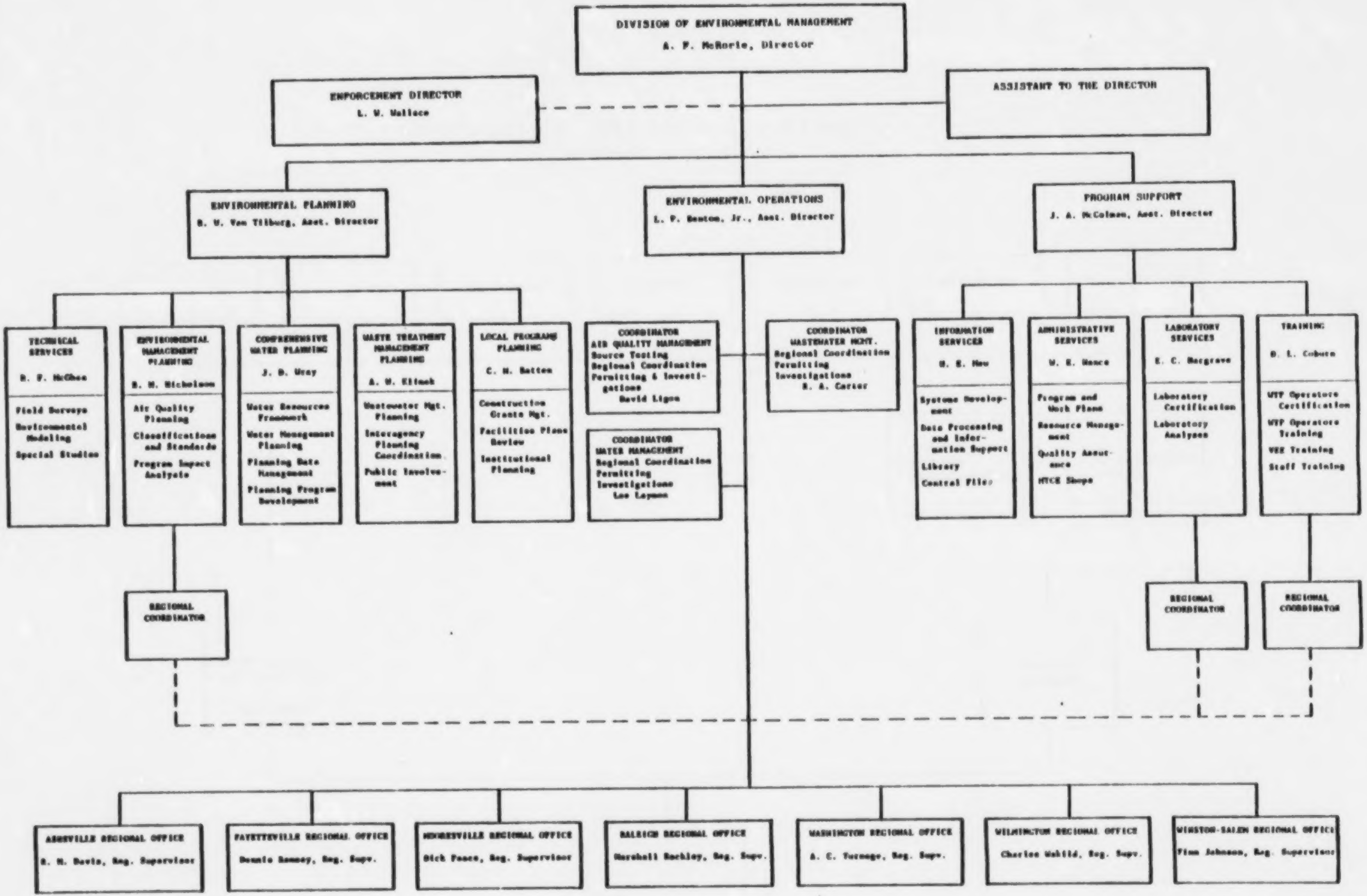

DIVISION OF ENVIRONMENTAL MANAGEMENT
A. F. McRorie, Director
ENFORCEMENT DIRECTOR
L. W. Wallace
ASSISTANT TO THE DIRECTOR
ENVIRONMENTAL PLANNING
R. W. Van Tilburg, Asst. Director
ENVIRONMENTAL OPERATIONS
L. P. Benton, Jr., Asst. Director
PROGRAM SUPPORT
J. A. McColman, Asst. Director
TECHNICAL SERVICES
R. F. McGhee
Field Surveys
Environmental Modeling
Special Studies
ENVIRONMENTAL MANAGEMENT PLANNING
R. M. Nicholson
Air Quality Planning
Classifications and Standards
Program Impact Analysis
COMPREHENSIVE WATER PLANNING
J. D. Wray
Water Resources Framework
Water Management Planning
Planning Data Management
Planning Program Development
WASTE TREATMENT MANAGEMENT PLANNING
A. W. Eltman
Wastewater Mgt. Planning
Interagency Planning Coordination
Public Involvement
LOCAL PROGRAMS PLANNING
C. H. Batten
Construction Grants Mgt.
Facilities Plans Review
Institutional Planning
COORDINATOR AIR QUALITY MANAGEMENT
Source Testing
Regional Coordination
Permitting & Investigations
David Ligon
COORDINATOR WATER MANAGEMENT
Regional Coordination
Permitting
Investigations
Lee Layman
COORDINATOR WASTEWATER MGMT.
Regional Coordination
Permitting
Investigations
R. A. Carter
INFORMATION SERVICES
W. E. Haw
Systems Development
Data Processing and Information Support
Library
Central Files
ADMINISTRATIVE SERVICES
W. E. Nance
Program and Work Plans
Resource Management
Quality Assurance
MTCE Shops
LABORATORY SERVICES
E. C. Hargrove
Laboratory Certification
Laboratory Analyses
TRAINING
D. L. Coburn
WTP Operators Certification
WTP Operators Training
VEE Training
Staff Training
REGIONAL COORDINATOR
REGIONAL COORDINATOR
REGIONAL COORDINATOR
ASHEVILLE REGIONAL OFFICE
R. M. Davis, Reg. Supervisor
FAYETTEVILLE REGIONAL OFFICE
Dennis Ramsey, Reg. Supv.
MOORESVILLE REGIONAL OFFICE
Dick Peace, Reg. Supervisor
RALEIGH REGIONAL OFFICE
Marshall Bachley, Reg. Supv.
WASHINGTON REGIONAL OFFICE
A. C. Turnage, Reg. Supv.
WILMINGTON REGIONAL OFFICE
Charles Wakild, Reg. Supv.
WINSTON-SALEM REGIONAL OFFICE
Finn Johnson, Reg. Supervisor

FIGURE III-4
Organization of Division of Environmental Management
After September 1, 1978

authority to carry out a comprehensive control program. Table III-1, on the following page, shows that the Act vests most of the authority in the EMC which, as permitted by law, has delegated much of the authority to the DNRCD's Division of Environmental Management.

In addition, Subchapters 2D and 2H of Title 15 of the North Carolina Administrative Code (NCAC) set forth the air pollution control requirements and procedures for permits. These requirements, discussed in detail in Chapter IV, provide the basis for most of the Air Quality Section programs described in detail in Chapter V.

(3) Program Resources and Management Practices

The adequacy of program resources and management practices affect the agency's effectiveness in promoting continuing compliance. Therefore, this section describes and analyzes:

- Manpower resources
- Budget resources
- Recordkeeping practices.

1. Manpower Resources

Given the North Carolina policy of fostering voluntary compliance and of implementing this policy by developing a "professional consultation" relationship between agency and source personnel, adequacy and stability of staffing levels potentially are important determinants of program effectiveness. Tables III-2 and III-3 provide overviews of total staffing levels and turnover and professional staffing levels and turnover. According to the data, between 1970 and 1978, total staffing rose 502 percent and professional staffing levels increased by 690 percent in order to carry out ever-expanding responsibilities. The largest jump in total staffing occurred between 1971 and 1972 (457 percent), most likely in order to carry out the control strategies developed for the SIP.[1]

---

[1] In 1973, only 78 staff members worked directly on air quality programs. The remainder worked indirectly on air quality programs in other sections of the DEM. The data for that year does not distinguish between the direct/indirect categories either for staffing totals or resignations.

TABLE III-1
Authorities and Responsibilities of Environmental Management Commission and Department of Natural Resources and Community Development

	ENVIRONMENTAL MANAGEMENT COMMISSION (EMC)	DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT (DNRCD) DIVISION OF ENVIRONMENTAL MANAGEMENT (DEM)
GENERAL POWERS	GENERAL STATUTES, CHAPTER 143, ARTICLE 21 . Adopt, modify, revoke official regulations interpreting and applying provisions of G.S. 143 . Adopt, modify, revoke administrative rules and procedures . Direct investigations or enter property . Require written statements or filing of reports under oath . Delegate powers to one or more commission members, the Secretary or other qualified employee of the Department of Natural Resources . Institute civil actions in county superior court . Assess civil penalties . Agree upon, enter into settlements, compromises	GENERAL STATUTES, CHAPTER 143, ARTICLE 21 . Administer air quality program . Conduct scientific experiments, research, investigations . Cooperate with or enter into contracts with public/private organizations for surveys and research . Receive civil penalties . Provide administrative services to the Commission . Request Attorney General to institute a civil action for injunctive relief
SPECIFIC POWERS	GENERAL STATUTES, CHAPTER 143, ARTICLE 21 . Prepare and develop comprehensive plans for air pollution abatement, prevention, control . Determine degree of air contamination . Develop and adopt air quality standards . Develop and adopt classifications of air contaminant sources . Develop and adopt emission standards . Adopt a program for testing motor vehicle emissions . Modify and revoke standards . Require written permit applications and plans . Approve, issue, renew, modify, revoke permits/temporary permits . Develop and adopt regulations for complex sources . Issue, modify, or revoke a special order, consent special orders, assurances of voluntary compliance . Declare an air pollution emergency . Certify, supervise, rescind certification of local programs	DELEGATED BY EMC . Recommend a comprehensive abatement plan . Conduct air quality monitoring . Recommend air quality standards . Recommend classification categories and register sources . Recommend emission standards . Draft a motor vehicle emissions inspection program . Recommend modifications to standards . Request information and review permit applications . Issue, deny, modify, or revoke permits and renewals, exempt sources . Draft and recommend regulations for complex sources . Draft special orders and special orders by consent . Determine and declare an air pollution emergency . Review and supervise local programs . Request data from source to determine compliance and specify testing procedures . Conduct surveillance to determine compliance . Issue notices of violation

TABLE III-2
Total Manpower Resources

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Total Filled Positions	14	14	78	91[1]	86	83	83	84	87
Resignations	2	1	6	18	9	N/A	4	5	13
Turnover Rate	14%	7%	7.7%	19.7%	10.5%	-	4.8%	5.9%	14.9%

TABLE III-3
Professional Manpower Resources

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Professional Filled Positions	10	10	72	79	72	75	75	76	79
Resignations	1	0	3	14	5	N/A	2	5	13
Turnover Rate	10%	0%	4.2%	17.7%	6.9%	-	2.7%	6.6%	16.5%

The potential advantage of this expansion in total staffing, however, has been offset by a periodic instability in turnover rates. Since 1972, total turnover has been above 5 percent for five of the six years for which data is available, and the professional turnover rate has been above that percentage for four of the six years. Another aspect of the turnover rate is that it has shown extreme peaks in professional turnover in 1973 and 1978, two years in which reorganizations occurred. These two characteristics of manpower resources suggest that the long-term success of the voluntary compliance approach is dependent on reducing and stabilizing the turnover rate.

Interview data suggests that despite the increase in state salaries between 1970 and 1978, the concentration of university, Federal government, and private research groups in the Research Triangle area has hampered the State's ability to be competitive in the marketplace. Of the 13 professional staff members who resigned in FY 1978, at least seven of them went into private industry or consulting. Table III-4 shows the change in salary range for professional and clerical positions between 1970 and the present. Not only have salaries within each State salary grade increased each year except 1975 but also several air quality professional and clerical positions have been upgraded on the scale.

2. Budget Resources and Practices

In order to lay the foundation for evaluating the cost and effectiveness of the direct regulation approach to controlling stationary source emissions, it is necessary to ascertain both the total level of budget resources a state expends on its air quality programs as well as the distribution of those resources among program elements. Thus, using grant applications, program plans, and interviews, one objective of Task I was to compare annual expenditures for key program elements. Since it is not an EPA requirement, however, the air quality program staff neither prepares grant applications and program plan budgets by program element nor tracks expenditures by program elements. Thus, while it was possible to determine the overall program budget trends displayed in Figure III-5, no information was available on budgets by program element other than the data displayed in Chapter V.

TABLE III-4
Air Quality Salaries July 1, 1970-July 1, 1979

Position Category	State Grade		Salary Range								
	Start	Current	1970	1971	1972	1973	1974	1975	1976	1977	1978
Engineer V	80	82	15,852-20,104	16,644-21,192	17,436-22,200	18,312-23,316	21,672-27,612	21,672-27,612	22,836-29,016	24,324-32,416	24,612-34,392
Engineer IV	78	79	14,388-18,324	15,108-19,236	15,828-20,148	16,620-21,156	18,780-23,880	18,780-23,880	19,836-25,104	21,120-28,092	21,348-29,784
Engineer III	76	77	13,080-16,632	13,728-17,460	14,376-18,288	15,096-19,212	17,052-21,672	17,052-21,672	18,036-22,836	19,212-25,524	19,404-27,060
Engineer II	75	75	12,468-15,852	13,092-16,644	13,716-17,436	14,388-18,312	15,468-19,692	15,468-19,692	16,392-20,784	17,460-23,208	17,652-24,612
Engineer I	72	72	10,800-13,728	11,340-14,412	11,880-15,096	12,480-15,852	13,416-17,052	13,416-17,052	14,256-18,036	15,180-20,124	15,396-21,348
Engineering Technician III	65	68	-	-	8,592-10,824	9,024-11,376	11,148-14,052	11,148-14,052	11,892-14,916	12,660-16,644	-
Engineering Technician II	62	65	6,828- 8,568	7,164- 9,000	7,500- 9,420	7,884- 9,900	9,708-12,240	9,708-12,240	10,392-13,032	11,064-14,520	11,232-15,396
Monitoring Technician	61	61	6,528- 8,172	6,852- 8,580	7,176- 8,988	7,536- 9,444	8,112-10,164	8,112-10,164	8,736-10,872	9,300-12,108	9,444-12,840
Meteorologist	72	72	-	-	-	-	-	13,416-14,256	14,256-18,036	15,180-20,124	15,396-21,348
Information Systems Coord.	72	72	-	-	-	12,480-15,852	13,416-17,052	13,416-17,052	14,256-18,036	15,180-20,124	15,396-21,348
Environmental Research Spec.	67	67	-	-	-	-	-	10,644-13,416	11,364-14,256	12,108-15,888	12,276-16,848
Chemical Consultant	71	71	-	-	-	-	-	12,816-16,236	13,632-17,184	14,520-19,212	14,724-20,376
Chemical Analyst II	66	66	8,172-10,308	8,580-10,824	8,988-11,340	9,444-11,916	10,164-12,816	10,164-12,816	10,872-13,632	11,580-15,180	11,736-16,092
Clerk II	53	54	-	-	4,992- 6,252	5,484- 6,888	-	-	-	-	-
Steno II	54	56	4,740- 5,952	4,980- 6,252	5,220- 6,552	6,000- 7,536	-	-	-	-	-
Clerk/Steno II	53	56	-	-	-	-	5,640- 7,080	6,456- 8,112	7,070- 8,736	7,476- 9,708	7,608-10,296
Steno III	55	56	-	-	5,460- 6,852	5,736- 7,200	6,456- 8,112	6,456- 8,112	7,020- 8,736	7,476- 9,708	7,608-10,296
Steno IV	58	59	-	-	6,252- 7,848	6,576- 8,244	7,416- 9,276	7,416- 9,276	8,016- 9,948	8,532-11,064	8,664-11,736

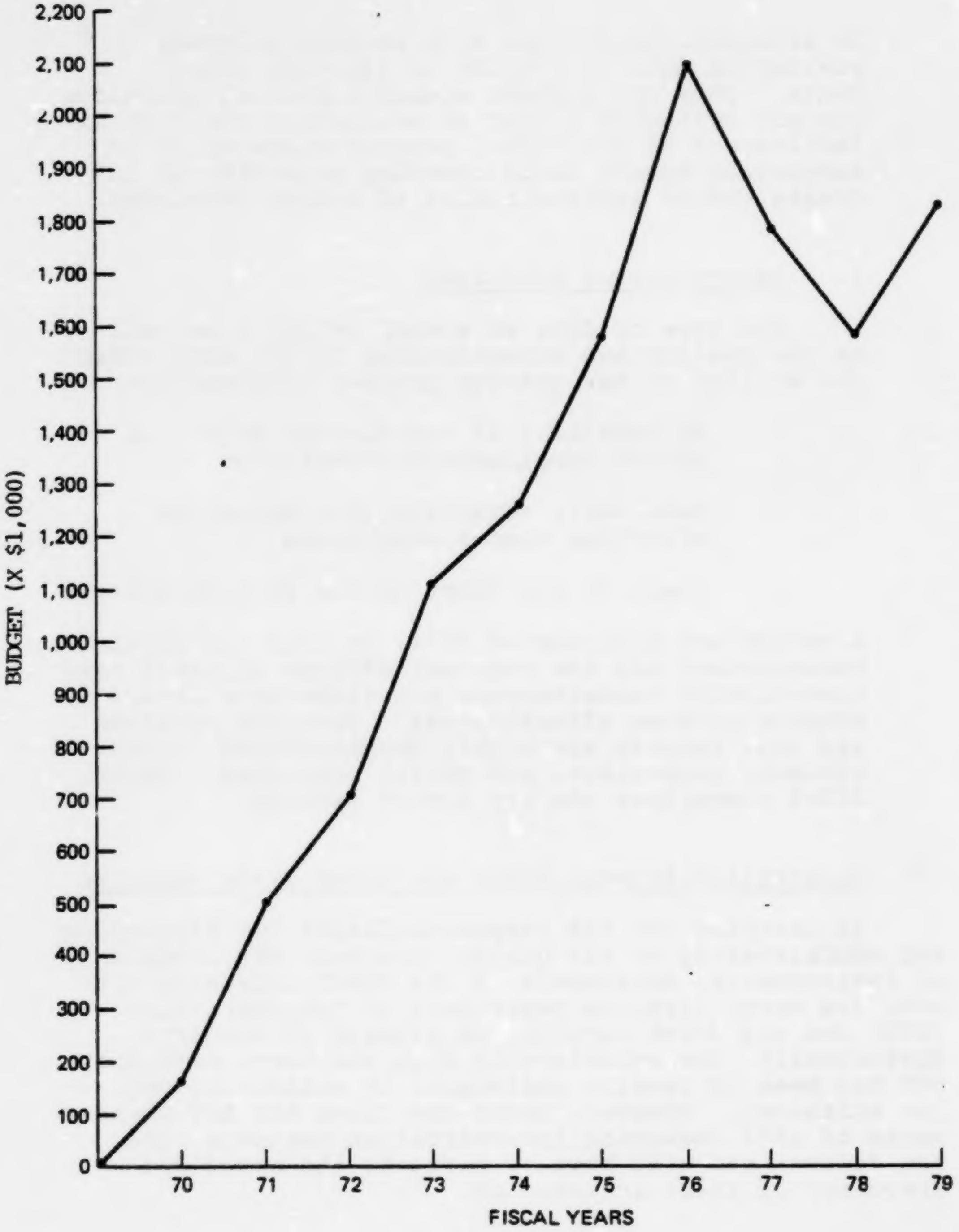


FIGURE III-5
Budget Resources FY 1970-1979

In addition, interviews with program managers yielded no data with which to identify actual costs. Thus the present agency budgeting practices are not conducive either to evaluating the cost effectiveness of individual program elements or to supporting agency decisionmaking regarding an increase and/or redistribution of budget resources.

3. Recordkeeping Practices

The type of data an agency collects as well as the quality and accessibility of the data affect the ability of air quality program managers to:

- Be cognizant of the current extent of source compliance/noncompliance
- Make daily administrative decisions affecting source compliance
- Identify and adopt needed program changes.

A review and analysis of files in both the Raleigh Headquarters and the regional offices suggests that historically recordkeeping practices have failed to enhance program effectiveness. Specific problems are that records are highly decentralized, inconsistent, incomplete, and poorly organized. Table III-5 summarizes the key agency records.

(4) Interaction Between DNRCD and Other State Agencies

In carrying out its responsibilities for developing and administering an air quality program, the Division of Environmental Management of the DNRCD interacts with both the North Carolina Department of Transportation (DOT) and the North Carolina Department of Commerce. Historically, the relationship with the North Carolina DOT has been to receive assistance in estimating vehicular emissions. However, under the Clean Air Act Amendments of 1977 requiring transportation controls, the two departments will have to increase the scope and frequency of their interaction.

TABLE III-5

Overview of Record Keeping Practices
(Enforcement Activities)

Record Type	Location/Accessibility	Organization	Contents	Quality/Usefulness
Civil Penalty Notebooks "Air Quality Enforcement Actions"	DEM Headquarters, 9th floor, Office of Enforcement; Access upon request to Kirt Cox or Craig Bromby	One notebook per year organized by case number	Summary sheet at front of each notebook listing case number, source name, date received by enforcement, alleged violation, agency and source actions, action by Attorney General (if any) Numbered case files containing violation documentation, memos of agency/source meetings, regional inspectors recommendation, findings and decision memo, correspondence with source including requests for administrative hearings, deferral or reduction of penalty	Summary sheet is a useful device for identifying number of cases referred annually, final outcome, and time frame; principal weakness is that files do not indicate whether violation was corrected and on summary sheet some categories of data missing for some penalty cases
Air Quality Special Order Notebooks	Same as Civil Penalty Notebooks	By special order number	Copies of special orders and summary sheet of special order number, source name, date signed by company, date issued by EMC, scheduled compliance date	Summary sheets are incomplete and do not indicate whether compliance date was met but are useful for identifying number of orders issued each year and average duration
Special Order Files	DEM Headquarters, 9th floor outside Office of Air Quality Management Coordinator	Alphabetical by source name	Information regarding specific increments, or steps, of compliance, scheduled and actual date of compliance with each step	Files are useful for evaluating specific sources but not for program assessment since over 200 raw files must be reviewed to generate statistical data. Information in several files is incomplete
Special Order List	Presently on loan to Booz, Allen; previously in Office of Coordinator, Air Quality Management	By special order number	Handwritten list of SOC number, source name, date mailed to company, date returned signed by company, date of public notice, scheduled compliance date for each required step; date of EMC approval	List is difficult to read and many data categories for many sources are not complete; list does not indicate clearly whether scheduled compliance dates were met; some discrepancies with list in Enforcement Office

TABLE III-5
(Continued)

Overview of Record Keeping Practices
(Permit Activities and Central Program Records)

	Record Type	Location/Accessibility	Organization	Contents	Quality/Usefulness
PERMIT ACTIVITIES	Permit Notebooks	DEM Headquarters, 9th floor, Air Quality Management; Easy access	Twenty, two-inch black ring binders organized by permit number; renewals filed by original permit number accompanied by suffix "R"	Cover letter to source, copy of permit, renewal, extension, or amendment; permit consists of permit number, issuance date, name and location of applicant, type of equipment or process, and sometimes the allowable emission rate and applicable regulations	Difficult to use for program evaluation and decisionmaking because contents are not strictly in chronological order and contents are not retrievable by company name, date of permit issuance, date of permit expiration, geographical location or any other analytical category
	Permit Card File	DEM Headquarters, 9th floor, Air Quality Management, Derr Leonhardt's office; Access upon request to Derr Leonhardt	Alphabetical order by company name	Permit number, date of application, and final action taken	Limited usefulness since data is not retrievable by year, geographical location, type of action without reviewing entire multi-drawer file
CENTRAL PROGRAM RECORDS	Source Files	DEM Headquarters, 9th floor, Central File Room	By source name within each county; there is no chronological order	Contains permit applications, permits, request for action (inspections, complaint investigations, permit renewals), stack test reports, drawing of plant with surrounding areas	Files are highly disorganized and incomplete; many source files are missing permit applications and permits or have a 1-2 year gap in inspection reports; no chronology or inventory of all control equipment/emissions permits in plant; no notations of violations; no overall index to central files

TABLE III-5
(Continued)

Overview of Record Keeping Practices
(Surveillance and Monitoring Activities)

Record Type	Location/Accessibility	Organization	Contents	Quality/Usefulness
Source Testing Files	DEM Headquarters, 9th floor, Air Quality Management; Access by request to Michael Aldridge	Filed by company name	All source test reports, both agency conducted and source conducted	Entire set of files must be reviewed to generate data on number of agency conducted tests; report does not indicate why test was conducted under representative conditions; contains some useful source specific performance data
Source Testing Card File	Same as Source Testing Files	Filed by source name	Records source name and address, cognizant regional office, source type, pollutants, applicable standards, process rate, allowable emission rate, and dates of regional contact, pretest survey, test, lab analysis and report sign off	Color coding is useful for separating and counting agency vs source conducted tests
Inspection Reports	Central source files in headquarters and regional source files	Filed on "Request for Action" forms	Findings regarding detection of violations from complaint investigations, engineering evaluations, site inspections, visible emissions tests	Decentralized filing of reports means they cannot be used to track annual activity levels or generate an evaluation of the adequacy of surveillance activities

Interaction with the Department of Commerce generally consists of exchanging information rather than program planning and implementation. Specifically, the agencies exchange views on the impact proposed industrial projects will have on air quality and the impacts of air quality programs on industrial development.

2. AIR POLLUTION CONTROL AT THE LOCAL LEVEL

Article 21 of Chapter 143 of the General Statutes of North Carolina authorizes local governments, subject to the approval of the EMC, to establish and administer a local air pollution control program. In addition, the statute provides certification of such local agencies by the EMC and requires the state to supervise these agencies. Agencies fully certified by the Commission are authorized to adopt air quality and emission control standards of their own or to adopt the regulations, rules, and standards of the Environmental Management Commission.

(1) Programs Receiving Federal Funding

In North Carolina, there are presently three local air pollution control programs receiving Federal funding. These programs are:

- Western North Carolina Regional Air Pollution Control Agency (includes Buncombe and Haywood counties)
- Mecklenburg County Air Pollution Control Agency (single county)
- Forsythe County Air Pollution Control Agency (single county)

In each case, the county commissioners established pollution control boards which formulate the policies under which these three agencies operate. In two of these agencies, the county board of health was designated as the air pollution control board. In the other agency, a specific board has been appointed. State statute specifies that should one or more of these local agencies

---

[1] Certified programs are funded with Federal and local funds and receive no state funds.

be unable to carry out their responsibilities, the Environmental Management Commission will assume jurisdiction. In fact, this happened in the case of a fourth Federally funded air pollution control agency in Gaston County which suspended operations as of July 1, 1977.

(2) Programs Without Federal Funding

In addition to the fully certified programs described above, the EMC partially certified the following five air pollution control agencies programs:

- Cleveland County
- Rowan County
- Guilford County
- Durham County
- Cumberland County.

Each of these agencies retains jurisdiction over visible emissions and open burning. In all five cases, the programs are located within the county health department, and the county has designated its Board of Health as the Air Pollution Control Board. Unlike the fully certified programs, these partially certified programs do not receive matching Federal funds.

(3) Oversight Role of the State

With respect to the programs receiving Federal funding, the Air Quality Section assesses the capabilities and authority of the local government to carry out a full air pollution control program. Based on the assessments made by the Air Quality Section, the Environmental Management Commission determines which authority to delegate to the local program. The Commission is prepared to assign the functions of the local program to the state should the local program not be operating correctly.

A staff member of the monitoring unit of the Air Quality Section has ongoing responsibility for supervising all local programs. This staff member meets every other month with representatives from both the federally funded and nonfunded agencies. In addition, the fully certified programs apply for grants from and report to EPA through the state.

3. ECONOMIC INCENTIVES

The North Carolina General Statutes provide at least two economic incentives for sources to comply with emissions standards. First, Chapter 105-130.10 provides for the amortization of air cleaning devices over a 60-month period. In other words, in lieu of taking a depreciation allowance, sources can elect to take a tax deduction for the cost of purchasing, constructing, or installing any air cleaning device or pollution abatement equipment which reduces emissions. To qualify for this deduction, the source must obtain a certificate from the SEcretary of the DNRCD. This certificate verifies that the EMC found the equipment to be in compliance with the requirements, to be effectively operated in compliance with the permit, and to be used primarily for the reduction of air pollution.

Second, Chapter 159(c) authorizes the governing body of a county to establish a County Industrial Facilities and Pollution Control Financing Authority

> to aid in financing pollution control facilities for industry in connection with manufacturing and industrial facilities and public utilities; provided, however, that it is the policy of the state to finance only those facilities where there is ... an improvement in the degree of prevention or control of pollution commensurate with the size and cost of the facilities.[1]

Three principal steps are involved in the establishment of the authority. The first is for the county to notify both DNRCD and the Local Government Commission of the State of its intention to create the authority. The second step is to create the authority by resolution. Third, the county must appoint a board of seven commissioners to direct the authority.

---

[1] North Carolina General Statutes, Chapter 159C, "Industrial and Pollution Control Facilities Financing Act," § 159C-2.

IV. REQUIREMENTS IMPOSED ON INDUSTRIAL POINT SOURCES

In compliance with the Clean Air Act of 1970, North Carolina submitted, in 1972, a State Implementation Plan for achieving and maintaining National Ambient Air Quality Standards (NAAQS). The revised plan, submitted in 1976, contains strategies for controlling the following pollutants:

- Sulfur oxides (SO_2)
- Particulate emissions
- Carbon monoxide (CO), hydrocarbons (HC), photochemical oxidants, and nitrogen oxides (NO_x).

The overall strategy was to regulate both stationary (area and point) and mobile sources through a combination of ambient and emission standards. Table IV-1 provides an overview of the following types of source specific requirements:

- Registration
- Emission controls
- Monitoring and reporting
- Permitting.

The remainder of the chapter describes each category in greater detail, laying the foundation for evaluating the effectiveness of agency programs for promoting reductions in stationary source emissions.

1. REGISTRATION PROCEDURES

North Carolina regulations require all significant sources of air pollution, both combustion and noncombustion, to register with the DEM within 60 days of the effective date of an applicable regulation or emission standard. Subsequent to receipt of the registration form, the DEM may request the following types of data from sources:

- Quantities and kinds of raw materials
- Process flow sheets
- Operating schedules

TABLE IV-1

Summary of North Carolina Regulations for Stationary Sources

REGULATION		DESCRIPTION	AGENCY INTERPRETATION
2D .0202	Registration of Air Contaminant Sources	Establishes categories of sources and requires sources to register with DEM and supply requested information	Regional staff uses North Carolina Manufacturing Index, news articles, other sources to promote voluntary compliance
2D .0501	Compliance with Emission Control Standards	Specifies compliance demonstration mechanism and testing procedures; requires sources to comply with ambient standards	Regional and HQ staff adhere to compliance testing procedures but are lax in enforcing ambient provision due to length of time required to conduct an ambient study
2D .0503	Control of Particulates From Fuel-burning Sources	Establishes an hourly rate table relating million Btu/hour input to lbs./million Btu allowable emissions	Applies to coal and oil facilities; input rate used is that of manufacturer's rated heat input. If visible emissions are observed, regional inspector requests a stack test which has a ±20% tolerance factor. If a violation is detected above 20%, region initiates an enforcement action (usually SOC). If a violation is below 20%, region provides professional consultation to source to foster some improvement
2D .0504	Particulates From Wood-burning Indirect Heat Exchangers	Establishes an hourly table relating million Btu/hour input to lbs./million Btu allowable emissions	Fuel input is calculated on a dry basis; same procedure as above to determine need for an enforcement action
2D .0505	Control of Particulates From Refuse-burning Equipment	Establishes an hourly rate table relating pounds of refuse charged per hour to allowable emissions in lbs./hour	Literally interpreted if source test is conducted
2D .0506	Control of Particulates From Hot Mix Asphalt Plants	Establishes a table relating aggregate process rate in tons/hour to allowable emissions in lbs./hour	Very stringent when source test conducted since back half of the sample is included
2D .0507	Particulates From Chemical Fertilizer Manufacturing Plants	Establishes a process rate/allowable emissions table	Literally interpreted when source test conducted

TABLE IV-1 (Continued)

REGULATION		DESCRIPTION	AGENCY INTERPRETATION
2D .0508	Control of Particulates From Pulp and Paper Mills	Establishes allowable emissions for recovery furnace stack, dissolving tank vent, and line kiln stack Specifies a 35% opacity limit from a Kraft pulp recovery boiler, not to be exceeded for more than 5 min./hr. or 20 min./24 hr.	Source test is stringent since back half of sample is counted State uses 24 hour standard, taking readings every 15 seconds for either 30 minutes or 1 hour
2D .0509	Particulates From Mica or Feldspar Processing Plants	Establishes a process rate table Requires dust control	Literal interpretation
2D .0510	Particulates: Sand, Gravel, Crushed Stone Operations	Requires compliance with ambient standard at the property line Requires dust control	Not strictly enforced due to difficulty and time consumption involved in documenting ambient violation; looked for spray equipment and visible fugitive emissions
2D .0511	Particulates, SO_2 From Lightweight Aggregate Process	Requires dust control; water spray; 95% particulate removal on all stacks serving kilns or dryers and limits SO_2 emissions to 2.3 lbs. per million Btu input	Regional staff attempted to enforce literally; the one source subject to regulation unable to comply and has sought a change in the standard
2D .0512	Particulates From Wood Products Finishing	Requires "adequate duct work and properly designed collectors" Prohibits violation of ambient air quality standards at the property line	Not strictly enforced but according to a letter from DEM to Thomasville Furniture regulation is interpreted as requiring zero visible emissions
2D .0513	Control of Particulates From Portland Cement Plants	Requires 99.7% control and emissions which do not exceed 0.327 pounds/barrel	Literally applied
2D .0514	Control of Particulates From Ferrous Jobbing Foundries	Establishes a process weight emissions rate table for sources existing on or before January 1, 1972 (New foundries or foundries larger than shown in the rate table are regulated under Regulation .0515)	Literally applied

TABLE IV-1 (Continued)

REGULATION		DESCRIPTION	AGENCY INTERPRETATION
2D .0515	Particulates From Miscellaneous Industrial Sources	Establishes a process weight emissions rate table	Some disagreement regarding what is included in process weight (e.g. dry weight or wet weight of fiber); process weight is calculated/applied to each step of the process regardless of whether emissions are through a single stack; extensive regional variations
2D .0516	SO_2 Emissions Fuel-burning Installations	Prohibits emissions in excess of 2.3 pounds SO_2 per million Btu input except that sources subject to NSPS and NESHAPS must comply with those standards	Standard applies only to indirect heat exchangers; no limit on SO_2 emissions/Btu input for a direct fixed unit (department policy)
2D .0517	Emissions From Plants Producing Sulfuric Acid	Limits SO_2 emissions to 27 pounds for each ton of sulfuric acid produced Limits acid mist emissions to 0.5 lb./ton sulfuric acid produced	Strictly applied if source test conducted
2D .0518	Control of Hydrocarbon Emissions From Stationary Sources	Requires vapor recovery or control of vapor loss for storage Requires facilities using photochemically reactive solvents to have 85% removal if over 40 pounds of organic materials per day is discharged	Regional discrepancies on definition of a solvent and identification of reactive vs non-reactive solvents The 40 pounds per day limit is loosely defined, i.e., it is averaged out over a year
2D .0520	Control and Prohibition of Open Burning	Requires permit for open burning and specifies types of open burning allowed	Some variation in interpreting allowable types of open burning
2D .0521	Control of Visible Emissions	For sources existing on July 1, 1971 requires that opacity not exceed 40% for more than 5 minutes in 1 hour or 20 minutes in 24 hours For new sources establishes a 5 minute/hour and 20 minutes/24 hours standard of 20%, except that under specified conditions new sources can be subject to the 40% standard	The 20 minute standard is used with readings taken every 15 seconds

TABLE IV-1 (Continued)

REGULATION		DESCRIPTION	AGENCY INTERPRETATION
2D .0522	Control And Prohibition of Odorous Emissions	Prohibits operations that produce odorous emissions and requires plants engaged in animal, mineral or vegetable processing to control odorous emissions	Infrequently used because of difficulty of measuring odor threshold at ground level
2D .0523	Control of Conical Incinerators	Establishes equipment and operating standards; applies ambient and visible emissions standards; establishes siting requirements and compliance schedule; requires monitoring	Very stringent application; successful in reducing number in state from 600 to 5; monitoring standard costs source approximately $3000/year
2D .0524	New Source Performance Standards	Requires sources subject to the NSPS in 40 CFR 60 to comply with all requirements in those standards rather than with the state regulations; applications and reports are to DEM rather than EPA	Literally applied
2D .0525	National Emissions Standards For Hazardous Air Pollutants	Requires sources subject to the NESHAPS in 40 CFR 61 to comply with all requirements in those standards rather than with state regulations; applications and reports are to DEM rather than EPA	Literally applied
2D .0527	Emissions From Spodumene Ore Roasting	Emission of SO_2 shall not exceed 9.7 pounds/ton of ore roasted and sulfuric acid mist (H_2SO_4) emissions shall not exceed 1.0 pounds per ton of ore roasted	Only one plant of this kind in the state
2D .0603	Sources Covered by NSPS	Requires sources subject to NSPS to be monitored in compliance with those standards and excess emissions reported as specified quarterly to EMC	Literally applied
2D .0604	Sources Covered by Implementation Plan Requirements	References sections of Appendix P of 40 CFR 51 as monitoring requirements Establishes exceptions and procedures for alternative monitoring and reporting	Few sources are subject to any monitoring requirements

TABLE IV-1 (Continued)

REGULATION		DESCRIPTION	AGENCY INTERPRETATION
2D .0605	Wood and Wood-Fossil Fuel Combination	Requires visible emissions detector and recorder on any stack when heat input to any individual steam generator unit exceeds 250 million Btu/hour and annual average capacity factor is greater than 30 percent	Eighteen months moratorium until 12/78 to install equipment; applies to existing sources
2D .0606	Other Coal or Residual Oil Burners	Requires recordkeeping and reporting to EMC of violations Requires determination of SO_2 emissions when sum of heat inputs from coal and residual oil to any individual unit exceeds 250 million Btu/hour and the unit has an annual average capacity fractor of greater than 30 percent Determination may be made by a continuous monitor or by analysis of representative fuel samples	Literally applied; fuel analysis more prevalent than continuous monitor
2D .0607	Exceptions to Monitoring and Reporting	Exceptions include sources not subject to emission standards, sources scheduled for retirement by October 6, 1980, during a period of monitoring system malfunction, sources operated less than 30 days/year	Literally applied
2D .0608	Program Schedule	Requires sources subject to .0603, .0604, .0605, or .0606 to have a monitoring program by a specified date and submit program to DEM for review	Approval system is still being developed
2D .0609	Monitoring Condition In Permit	Establishes that monitoring requirements shall be incorporated in permit	Few permits cite monitoring requirements

TABLE IV-1 (Continued)

REGULATION	DESCRIPTION	AGENCY INTERPRETATION
2H .0601 Air Quality Permits: Purpose and Scope	Requires permits for establishment or operation of any air contaminant source; building, using, or operating any equipment likely to cause air pollution; alteration of construction or operation of air contaminant process; entering into a contract for the construction and installation of any air cleaning device, or allowing the operation of such device Specifies certain exemptions and procedures for obtaining exemptions	Literally interpreted

- Total weights and kinds of air contaminants released
- Types and quantities of fuels used
- Stack heights.

The only sources exempt from the registration requirement are those operating internal combustion engines or fuel burning equipment for comfort heating. Between 1971-72, the Air Quality Section made a massive effort to register all sources and in fact registered approximately 14,000 sources.

2. EMISSION CONTROLS

The state regulations establish two types of emission controls. The principal type is the emission standard which specifies the maximum allowable emission per unit of time related to process unit. Sometimes, requirements for fugitive dust control systems or other procedures supplement the emission rate limitations. The following paragraphs summarize key emission controls.

(1) Sulfur Dioxide (SO_2) Controls

Regulations specifying emission rate limitations have been established for the following point source categories:

- Fuel burning
- Sulfuric acid manufacturing
- Spodumene ore roasting
- Lightweight aggregate processing.

Table IV-2 shows the specific standards for existing and new fuel burning and sulfuric acid manufacturing sources, the state's most significant SO_2 sources. Existing fuel burning sources were allowed to meet the emission limitation either through the use of low sulfur fuel or SO_2 removal from stack gases. For new source compliance with the current standard, fuel sulfur content must not exceed one percent by weight. In implementing the SO_2 regulations, the EMC adopted a policy of promoting voluntary cooperation. This policy is described in detail in Chapter V.

TABLE IV-2
North Carolina SO_2 Emission Standards

SOURCE TYPE	STANDARD
Fuel Burning Installations (Existing)	2.3 pounds SO_2 per million BTU input
Fuel Burning Installations (New)	1.6 pounds SO_2 per million BTU input
Lightweight Aggregate Process	2.3 pounds SO_2 per million BTU input
Sulfuric Acid Plants	27 pounds SO_2 per ton sulfuric acid produced Five-tenths of a pound acid mist per ton sulfuric acid produced
Spodumene Ore Roasting	9.7 pounds SO_2 per ton ore roasted 1.0 pound sulfur acid mist, H_2SO_4, per ton ore roasted

(2) Control of Particulate Emissions

The approach to the control of particulate emissions from stationary sources included the promulgation of both visible emissions (opacity) standards and standards specifying the maximum quantity of particulate emissions allowed per unit of time related to process unit. Separate particulate emissions standards were set for large and small fossil fuel burning units, large and small wood burning units, industrial plants, and incinerators. In general, to meet the requirements, fossil fuel plants were expected to require high efficiency mechanical collectors or electrostatic precipitators, and wood burning units were expected to require mechanical collectors. The regulations for industry usually required equipment with 95 percent collection efficiency coupled with fugitive dust control measures.

(3) Control of Carbon Monoxide, Hydrocarbons, Photochemical Oxidants, and Nitrogen Dioxide

With respect to the control of these pollutants from stationary sources, the state has adopted the following strategy. First, facilities which store and use volatile substances are subject to regulations which require the provision of suitable facilities to prevent evaporation of hydrocarbons. In addition, specific emission control standards have been established for such sources as sulfuric and nitric acid manufacturing plants. Requirements also have been developed for oil and gas fired boilers of different sizes which must be met through boiler design modifications or changes in boiler firing procedures.

(4) Control of Visible Emissions

Table IV-3 shows the visible emissions standards imposed upon both existing and new sources as well as exceptions to the standards. New facilities are those established after July 1, 1971. In seeking exceptions, the burden of proof, according to the regulations, is on the source. The source must apply to the Director, DEM for an exception and, within 90 days, must submit a source test showing compliance with applicable emissions standards. It also must provide data showing that the exception will not result in a violation of ambient air quality standards.

TABLE IV-3
Visible Emission Requirements

TYPE FACILITY	STANDARD	EXCEPTION
. Existing Facilities	. No emission darker than #2 on the Ringelmann chart or opacity greater than 40% for an aggregate of more than 5 min. per hour, or 20 min. per 24 hours	
. New Facilities	. No emission darker than #1 on the Ringelmann chart or opacity greater than 20% for an aggregate of more than 5 min. per hour, or 20 min. per 24 hours	. 40% opacity permitted if source demonstrates compliance with particulate emission standards and ambient standards

3. MONITORING AND REPORTING

Separate requirements are established for each of the following four categories:

- Sources covered by Federal New Source Performance Standards (NSPS)
- Sources covered by SIP requirements
- Wood and wood-fossil combination units
- Other coal or residual oil burners.

Table IV-4 displays the specific requirements applicable to key categories of sources subject either to NSPS or the emission standards in the SIP. In addition to these point source category monitoring requirements, the sources are subject to reporting requirements. For NSPS sources, the requirements are:

- Notification to EPA and the state of physical and operational changes that may increase emission rates
- Notification of date upon which performance of the continuous monitoring system commenced
- Maintenance of records on occurrence and duration of plant, control equipment, and monitoring equipment, start-ups, shut-downs, and malfunctions
- Quarterly submission of excess emissions reports for sources required to monitor continuously.

Similarly, SIP sources required to install continuous monitors also must report excess emissions quarterly with an explanation of the nature and cause of the excess. Interviews with North Carolina officials, however, indicate that only 20-25 sources are required to have continuous emission monitors.

Monitoring and reporting requirements for the remaining two categories are as follows. Wood and wood-fossil fuel combination units must utilize a photoelectric or other type of visible emissions detector and recorder on any stack discharging the flue gasses from one or more steam generator units under the following conditions:

TABLE IV-4
North Carolina Source Monitoring Requirements

SOURCE TYPE	SIP MONITORING REQUIREMENTS	EXCEPTIONS
Fossil Fuel Steam Generators	Opacity (Continuous) SO_2 (>250 million BTU heat input/hr. and SO_2 controls installed) NO_x (>1000 million BTU heat input/hr.; located in AQCR requiring control strategy to meet national standard Oxygen or CO_2 (if required to convert SO_2 or NO_x data)	Performance test demonstrates emissions 30% or more below emission standard
Sulfuric Acid Plants	SO_2 (>300 tons daily production capacity)	
Nitric Acid Plants	NO_x (>300 tons daily production capacity; located in AQCR requiring control strategy to meet national standard	

- When the heat input to any single steam generator unit exceeds 250 million BTU per hour
- Annual average capacity factor is greater than 30 percent as demonstrated by the operator.

The source operator also is required to keep records of the measurements showing the date and duration of any violations of visible emission standards and submit violation records quarterly to the DEM. Other coal or residual oil burners not covered by NSPS or SIP monitoring requirements must make provisions for determining SO_2 emissions under the following conditions:

- Heat inputs to any individual unit exceeds 250 million BTU per hour
- Annual average capacity factor greater than 30 percent, as reported to the Federal Power Commission for calendar year 1974, or as otherwise demonstrated by the operator.

Determinations of SO_2 emissions may be made by a continuous monitor, by fuel analysis to ascertain BTU value and percent sulfur content or other procedure approved by the DEM Director. The data to be reported quarterly includes:

- Fuel analysis - quantity and type of fuels, the BTU value, sulfur content by weight, total calculated SO_2 emissions where excesses occur
- Continuous monitoring - emission rate expressed in the same units as the standard maximum instantaneous rate, total SO_2 emissions where excesses occur.

It should be noted that interviews with North Carolina officials indicated that only 20-25 sources are subject to continuous monitoring requirements.

4. PERMITTING REQUIREMENTS

Historically, permitting requirements in North Carolina have gone through three distinct phases. The first phase occurred from 1971-1973 during which time permits were issued only to new or modified sources and without any accompanying regulations specifying special requirements or procedures. From 1973 to 1976 the agency continued to operate in the absence of a permit regulation. However, the environmental statutes were amended to require existing sources also to obtain permits. This statutory amendment, according to agency staff members, did not result in a marked increase in permitting activities. In fact, several months passed before either the agency or sources became aware of the new requirement. In 1976, the permitting program entered its third phase, with procedures spelled out in a permitting regulation.

During all three permitting phases, sources have received a single permit for both construction and operation and in addition have been eligible for permits of a "temporary" nature. A source has been required to apply for a permit prior to construction of a facility or entrance into a contract for the construction, installation, or operation of pollution control devices. Between 1971 and 1975, sources subject to permitting which were unable to meet applicable emission standards were issued temporary permits allowing the excess emissions. These temporary permits were issued to those sources which submitted voluntary control plans for bringing operations into compliance as soon as possible. All major sources which were found to be out of compliance in July 1975 or subsequently went out of compliance were eligible for special orders by consent (SOC's). The SOC's, like the temporary permits, contained compliance schedules. Chapter V discusses in detail both the existing permitting procedures and the circumstances under which SOC's are used.

V. PRECOMPLIANCE AND POSTCOMPLIANCE PROGRAMS

This chapter provides a detailed description of the major programs administered by the Air Quality Section which are designed to regulate air pollutants from stationary sources. The regulatory process can be defined in terms of four phases:

- Pre-permitting
- Permit preparation
- Construction
- Continuing compliance.

For analytical purposes, the first three phases are described together as precompliance programs and the fourth phase is described as postcompliance programs. For each program, the discussion describes the structure and operation of the program as well as its budget and manpower resources. Table V-1, on the following page, provides an overview of agency precompliance and postcompliance activity levels between 1975 and 1978.

1. PRECOMPLIANCE PROGRAMS

This section describes the following six programs:

- The pre-1970 program
- Emissions inventory development
- Emission standard development
- Control strategy testing
- Permit preparation
- Surveillance and monitoring.

The objectives of these programs were to establish legally enforceable emissions limits with which to regulate point sources and to promote initial compliance by the sources. While the structure and operation of each program is discussed in detail, resource data is provided only for the permitting and monitoring/surveillance programs. Data for these programs is available since they are continuing ones, whereas the other four programs, for the most part, were of prime importance prior to 1976.[1]

---

[1] While the emission inventory is continuously updated and new emission standards developed in response to changed in Federal requirements, these programs are not central to the state's regulatory efforts.

TABLE V-1
Actual Activity Levels 1975-1978[1]

ACTIVITY	1975	1976	1977	1978
PERMITS	18	600	698	784
SOCs	0	150	24	7
CIVIL PENALTIES	4	10	2	4
Remissions requests	1	7	0	0
Remission denials	1	6	0	0
Remission approvals	0	1	0	0
STACK TESTS	34	23	54	48
COMPLAINTS	N/A	480	538	455

---

[1] FY 75 permit data is based on quarterly reprots to EPA and for FY 76, 77, and 78 on "Analysis of Previous Years Effort" contained in annual program plans. Data for other programs taken from agency files. Data for civil penalties is calendar year data.

(1) Overview of Pre-1971 Program

The existing State level air quality program dates back to July 1, 1967 when the Board of Water Resources became the Board of Water and Air Resources and the Department of Water Resources became the Department of Water and Air Resources. The Board, like its successor organization the EMC, was responsible for promulgating air quality policy and regulations. Day to day administration of the new air quality program was the responsibility of the Division of Air Pollution Control within the Department.[1] It carried out the following functions:

- Prepare emission inventories
- Establish state air quality standards (clean air goals)
- Develop individual control plans for Air Quality Control Regions (AQCR).

The initial North Carolina program thus appears to have been typical of the programs in most states.

With the Federal enactment of amendments in 1970, the Department of Water and Air Resources had to make some changes in its program. First, in 1970 the agency drafted open burning and visible emissions regulations which the Board of Water and Air Resources promulgated. Second, it required additional enabling legislation to obtain authority to promulgate emission control regulations, issue permits, and conduct inspections. The North Carolina General Assembly enacted this legislation in 1971. Third, the agency continued to develop its monitoring program, began making the emission inventory inventory changes described below, and began preparing to draft the State Implementation Plan (SIP). In July 1971, the agency drafted and adopted its ambient and emissions regulations.

---

[1] The Department later became the DEM and the Division became the Air Quality Section.

(2) Development of the Emissions Inventory

The emissions inventory, that is, the estimate of total statewide pollutant emissions from area, point, and mobile sources, together with an evaluation of the state's existing air quality, formed the basis for developing a strategy to attain and maintain national ambient standards. Over the years, North Carolina has made several improvements in the procedures for preparing the emissions inventory.

Between 1968 and 1971, staff members of the Air Quality Section began to compile an inventory by county covering the following sources:

- Fuel combustion from stationary sources (both area and point sources)
- Process losses from area and point sources
- Solid waste disposal (area and point sources)
- Transportation, and miscellaneous.

For each of these source categories, the inventory contained data for particulates, SO_2, NO_2, CO, and hydrocarbon. This first inventory was compiled by sending questionnaires to all sources listed in the North Carolina Manufacturing Index. No follow-up calls were made to nonrespondents, resulting in an incomplete inventory. In addition, the inventory relied on only gross estimated of pollutants from transportation and fuel consumption.

Beginning in 1971, state officials conducted a new emissions survey of sources listed in the Manufacturing Index. This time, however, there was a follow-up of nonrespondents. In addition, more sources and types of sources were inventoried. The questions on the survey were more specific, and the inventory was computerized. Other improvements included estimates of vehicle miles travelled (VMT) and modelling for some of the pollutants. At the present time, the inventory data is on computer, and the regional offices have responsibility for keeping it updated.

(3) Development of Emission Standards

A high degree of interaction between state officials and industry representatives was a salient feature of the process followed in adopting emissions standards. The Air Pollution Control Division (APCD) of the Department of Water and Air Resources,[1] utilized EPA guidelines to propose emission regulations. The Director of the APCD invited various industries to comment on the proposals. For example, with respect to SO_2 regulations, the Director asked for industry's opinion on whether the state should limit the sulfur content in fuel or set a SO_2 emission rate limitation. Industry's advice took three forms: submission of written comments, participation in conferences with APCD staff, and participation in hearings held by the Air Control Advisory Council.[2] During the hearings, industry representatives testified on their production and pollution characteristics, process rates, existing pollution controls (if any), and ability to meet proposed regulations. In general, industry's position was that regulations should be promulgated only when the state had documented ambient problems, that the regulations should establish emission units, and that the limits should reflect existing control technology and probable improvements. Based on this testimony, together with the emission inventory, air quality measurements, and advice of the APCD, the Council worked with the Board's pollution control committee to adopt and submit recommendations to the full Board. Subsequently, the Board authorized and held public hearings, evaluated the hearings' records and promulgated regulations which, with only a few exceptions, were satisfactory to industry.

Two significant changes in the source specific regulatory requirements illustrate the influence of industry in rulemaking. The first case involves the woodworking industry's success in obtaining a special regulation and one which was ambiguously worded and thus difficult to interpret and enforce. The second case involved the amendment of the visible emission regulation.

---

[1] The successor organizations respectively were the Air Quality Section, the Division of Environmental Management, and the Environmental Management Commission.

[2] The successor organization is the Air Quality Council.

APCD officials had intended to regulate particulate emissions from the woodworking industry under the process rate table established for the "miscellaneous industrial processes" regulation. Reluctant to meet the emissions limits established in that regulation, industry representatives requested a regulation that would apply specifically to woodworking facilities. During the development of the woodworking regulation, APCD staff pressed for a zero visible emission standard. Industry, however, was successful in obtaining a regulation which, rather than establishing a specific emission limit, required adequately designed duct work and adherence with ambient standards at the property line.

Table IV-1, which summarizes each regulation and the state's interpretation of compliance, suggests that the woodworking industry's success has resulted in a virtually unenforceable regulation. Specifically, the regulation's ambiguity resulted in Thomasville Furniture's request for an interpretation. In response, the Air Quality Section Staff composed a letter which interpreted the regulation as establishing a zero visible emissions requirement. The Section disseminated the letter not only to Thomasville Furniture but also to other furniture manufacturers and to all field offices. However, despite this interpretation, in 1975 EPA refused to issue Notices of Violation (NOV) to woodworking facilities, citing the regulation's ambiguity and unenforceability. North Carolina officials contend that if the regulation was inadequate a more appropriate EPA action would have been to issue a notice of SIP deficiency. EPA has not done this.

The second example of industry's successful role in influencing rulemaking was its attempt to amend the visible emission regulation. When the amendment originally became effective in July 1971, different standards were applicable to existing and new facilities. Existing facilites, those in operation prior to July 1, 1971, had to meet a 40 percent opacity requirement whereas new plants had to meet a 20 percent opacity requirement. In addition, by 1976, all old plants were expected to meet the 20 percent limit. Asserting that it would be able to meet particulate emission standards even if it exceeded the 20 percent opacity limit, industry petitioned the Environmental Management Commission for a change in the regulation. Based on a hearing held in 1977, the Commission amended the regulation to allow an exception to the 20 percent limit provided the source could demonstrate the exception would not lead to a violation of either ambient or emission standards for particulates.

Today, the process for rulemaking essentially is unchanged. Either industry petitions the EMC for an amendment, or the Division of Environmental Management submits a recommendation to the Commission. The latter usually occurs in response to amendments in the Federal CAA. The EMC receives advice from the Air Quality Advisory Council and sponsors public hearings. Based on the hearing record and input from industry, local governments, DEM officials and other interested parties, the EMC adopts new or revised regulations.

(4) Control Strategy Testing

Prior to incorporation of the emissions regulations in the SIP and submittal of the SIP to EPA, North Carolina tested its proposed control strategy using the following methods.

1. Sulfur Dioxide (SO_2) and Particulate Matter

In testing its control strategy for SO_2 and particulates, North Carolina designated the Metropolitan Charlotte Interstate Air Quality Control Region and the "example region." The state contracted with the Research Triangle Institute (RTI) to demonstrate, through the use of the air quality display model, the adequacy of the North Carolina regulations and standards to attain and maintain the national standards for sulfur dioxide and particulate matter. The Air Quality Section provided RTI with emissions inventory data for stationary sources and air quality data from sampling sites within the region. In addition, RTI computed emissions from area sources. These data together with meteorological data for the period 1966 through 1970 were used to determine future conditions, and thus the adequacy of the proposed control strategy.

2. Carbon Monoxide, Photochemical Oxidants and Nitrogen Dioxide

Again, the Metropolitan Charlotte area was used as the example region. Air quality measurements were conducted which showed compliance with CO and NO_2 standards and no need for a control strategy for those pollutants. The measurements, however, also showed that a control strategy for photochemical oxidants was required. Subsequent analysis showed a need to adopt hydrocarbon controls for stationary as well as motor vehicle sources in order to assure maintenance of the national standards for photochemical oxidants.

(5) Implementation of Regulations

Effectiveness of regulations is largely a function of the manner in which they are implemented. Two key aspects of implementation are:

- Notifying sources of applicable requirements
- Tracking source response to thoese requirements.

Historically, the AQS did not have a continuous, systematic method for notifying sources. Rather at various times the headquarters and regional staff utilized several mechanisms discussed below. The latter occurs in North Carolina within the context of specific program activities designed to foster continuing compliance. This section summarizes the principal tracking mechanisms which are also discussed in the sections on each program.

1. Notification of Facilities of Applicable Requirements

Typically, sources have learned about applicable requirements though a variety of published sources, mass mailings, and communications with air quality program staff. At the program's inception in 1967, sources were contacted as part of the emissions inventory preparation. Subsequently, industry was given an opportunity to participate in the development of emission requirements. Once the Board finalized the regulations, sources subject to those regulations became informed through agency mailings, Board minutes, public hearing records and personal contacts with state officials. Specifically, state officials made an effort to register all sources and to solicit permit applications. Today, the North Carolina Administrative Code and EMC minutes are the principal sources of information.

2. Tracking of Source Responses

The postcompliance surveillance and monitoring mechanisms described later in this chapter are also the principal methods for tracking source response to emission standards, the permit regulation, permit provisions, and SOCs. Specifically, regional inspectors have solicited permit applications from sources within their jurisdictions and have engaged in professional consultations with sources to assist sources in developing control plans which meet emission regulations. Site inspections, and engineering evaluations are frequently used means of tracking compliance with permits and SOCs. Visible emissions evaluations and source tests are other means of ascertaining source response to regulatory requirements. The tracking of SOCs is a regional responsibility and today is conducted manually, an earlier attempt at computer tracking having been unsuccessful. The state has had greater success in tracking permit renewal dates by computer. Thus, the state appears to have a sufficient variety of tracking mechanisms. However, it is difficult to evaluate the effectiveness of these tracking mechanisms given the decentralized nature of agency recordkeeping and the absence of records of many telephone and other communications between the agency and sources.

(6) Permit Preparation

Permits along with the source specific standards cited in Chapter IV form the basis for fostering a reduction in stationary source emissions. To evaluate the effectiveness of North Carolina's permit program, this section describes and analyzes the permitting activities of the Air Quality Section between 1971 and 1978.

A principal characteristic of the permit program is that it is impossible to ascertain the extent to which sources have received permits for all their emissions points. Table V-2 shows that the air quality program staff has identified a total of 12,375 sources of which 7.5% (931) were major ones and 92.4% were minor ones. It also shows that all major sources are required to have permits and appear to have applied for and received them. Of the nearly 12,000 minor sources, however, only 6,000 require permits and of these only about 2,000 have completed the permit process. Thus, according to Table V-2, approximately 2,900 sources have received permits. However, in actuality, the

TABLE V-2

Summary of Permit Program

Type Source	Total	Requiring Permit	Applied for and Received Permit[1]
Major Sources	931	931	931
Minor Sources	11,444	6,000	2,000
TOTAL	12,375	931	2,931

air quality staff has issued approximately 4,000 permits, excluding renewals. This apparent discrepancy reflects the fact that a single point source may consist of several emissions points. In some case, sources may have received a single permit covering multiple emissions points whereas in other cases the sources have received separate permits for each emission point. The agency has not kept track of the total number of permitted and unpermitted emissions points. However, permit renewal inspections, discussed later in this chapter, have resulted in the detection of previously unpermitted emissions points.

A second characteristic of the permit program is that the permitting load appears to have peaked in calendar year 1973 and subsequently have dropped off. Table V-3, for example, shows that in 1973 the agency processed 1,099 permits whereas in recent years the annual load has ranged between 600 and 800. The explanation for this pattern is that by July 1975 most new and existing sources had received their permits; in fact, the bulge in 1973 may reflect the statutory change extending permitting requirements to existing sources. Subsequently, the permitting load consisted predominantly of renewal applications, renewals typically occurring on a three or five year cycle, and a few applications for new and modified sources.

A third aspect of the permit program is that the agency appears to be effective in encouraging sources to submit control plans which meet agency requirements. Evidence for this is the low level of permit denials (13) between 1974 and 1978 shown in Table V-3. In addition, according to an agency conducted file review, only one source denied a permit initiated appeal proceedings and later dropped the appeal. Typically, sources denied permits develop new control plans with agency assistance and successfully resubmit their applications. However, despite the appearance that control plans are adequate, the source inspections conducted for Task II of this study have yielded data which raise significant questions regarding the adequacy of the permit review process. The Task III report will address this topic in greater detail.

TABLE V-3

Permit Activity Levels
1971-1978

TYPE ACTION	1971[1]	1972[2]	1973[3]	1974[4]	1975[5]	1976[5]	1977[6]	1978[6]
New permit or renewal	29	682	1,099	364	18	600	698	784
Denial	-	-	-	5	2	0	0	6

[1] 1971 calendar year; figure from Air Quality Section raw permit files

[2] 1972 calendar year; figure from Environmental Management Commission minutes

[3] 1973 calendar year; figure from semi-annual reports to EPA

[4] 1974 one-half calendar year permit approval figure based on last semi-annual report to EPA; denials based on Air Quality Section staff file review.

[5] 1975 fiscal year permit figure based on quarterly reports to EPA; denials based on AQS review of its files

[6] 1976, 1977, 1978 fiscal years; permit figure based on data in FY 77, 78, 79 program plans, denials on AQS review of its files

As mentioned previously, the permit regulation applies to both new, modified, and existing sources and provides for the issuance of a permit covering both construction and operation, rather than the issuance of two separate permits. Those sources required to obtain permits must do so before constructing or operating facilities; or before entering into contracts for the construction, installation, or operation of control equipment. Figure V-1, on the following page, shows that the source's permit application first goes to a permit review engineer in headquarters who reviews the application for completeness. Interview data indicates that the review engineers return 80-90 percent of the applications to the sources for additional data.

Once the review engineer receives a satisfactorily completed application, he conducts an engineering evaluation of the application, which may vary in detail depending on the nature of the source. For all sources, the review engineer determines which emission regulations are applicable and assesses whether the proposed control plan will result in compliance with the regulations. Next, the permit review engineer will request the modelling team in the Review and Analysis group to conduct modelling of the applicant's impact on ambient air quality in the following three cases:

- Sources subject to Federal New Source Review (NSR) requirements
- Sources subject to Federal Prevention of Significant Deterioration (PSD) rules
- Existing sources potentially posing ambient air quality problems.

Based on the modelling results, the review engineer makes one of three recommendations:

---

[1] Chapter IV provides an overview of the current permitting requirement as well as the historical changes in those requirements.

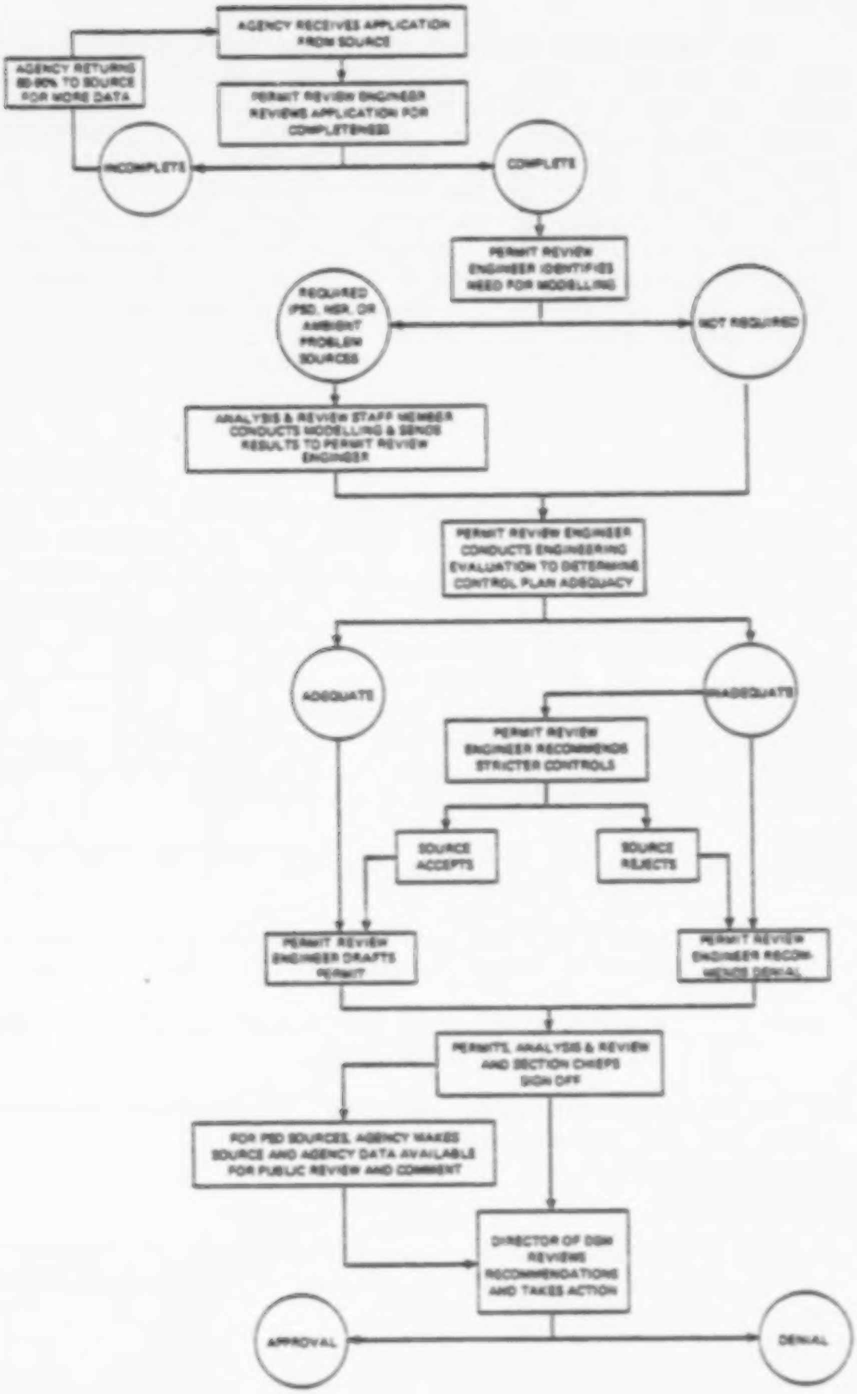

AGENCY RECEIVES APPLICATION FROM SOURCE
AGENCY RETURNS 80-90% TO SOURCE FOR MORE DATA
PERMIT REVIEW ENGINEER REVIEWS APPLICATION FOR COMPLETENESS
INCOMPLETE
COMPLETE
PERMIT REVIEW ENGINEER IDENTIFIES NEED FOR MODELLING
REQUIRED (PSD, NSR, OR AMBIENT PROBLEM SOURCES)
NOT REQUIRED
ANALYSIS & REVIEW STAFF MEMBER CONDUCTS MODELLING & SENDS RESULTS TO PERMIT REVIEW ENGINEER
PERMIT REVIEW ENGINEER CONDUCTS ENGINEERING EVALUATION TO DETERMINE CONTROL PLAN ADEQUACY
ADEQUATE
INADEQUATE
PERMIT REVIEW ENGINEER RECOMMENDS STRICTER CONTROLS
SOURCE ACCEPTS
SOURCE REJECTS
PERMIT REVIEW ENGINEER DRAFTS PERMIT
PERMIT REVIEW ENGINEER RECOMMENDS DENIAL
PERMITS, ANALYSIS & REVIEW AND SECTION CHIEFS SIGN OFF
FOR PSD SOURCES, AGENCY MAKES SOURCE AND AGENCY DATA AVAILABLE FOR PUBLIC REVIEW AND COMMENT
DIRECTOR OF DEM REVIEWS RECOMMENDATIONS AND TAKES ACTION
APPROVAL
DENIAL

FIGURE V-1
Process for Construction and Operating Permits

- The source must site elsewhere
- The source must develop more stringent controls
- The source meets emission and ambient requirements.

Having completed the engineering evaluation, the review engineer either recommends denial or drafts a permit.

Subsequent to the decisions made by the review engineer, the remainder of the permitting process includes the following steps. The permits, analysis and review, and air quality section chiefs each review and typically sign off on the review engineer's recommendations. For PSD sources, the agency makes public the emission and ambient data and its intention to issue a permit. The public has an opportunity to submit comments to the Director of the DEM. The Director makes the final decision regarding the disposition of the permit application. Between 1974 and 1978, the Director has denied eleven permit applications either because the engineering evaluation showed that the proposed control plan was insufficient to meet emission standards or because modelling showed a violation of ambient air quality standards.

According to the environmental statutes and regulations, the Director must issue a permit decision within 90 days after receipt of a completed application Thus, the entire permitting process may take as long as 120 days. Typically, the preliminary review for completeness of the application occurs within 30 days of the agency's receipt of the application. If during that period the review engineer judges the application to be complete, the 90-day period runs from the day the application was received. However, in those 80-90 percent of the cases where the application is returned to the source for additional information, the 90-day period begins again upon receipt of the supplementary data. Usually, the agency requires only 60 additional days at that point to reach a decision. In a few cases, it requires the additional 90 days.

Table V-4, on the following page, shows the manpower and budget resources the agency planned to expend on the permitting program acitivities for fiscal years 1977, 1978, and 1979.[1] It also shows proposed outputs,

---

[1] The data is for the state fiscal year which runs from July 1 to June 30.

TABLE V-4
Permit Program Resources
Fiscal Years 1977 - 1979

PROGRAM ACTIVITY	STATE FISCAL 1977			STATE FISCAL 1978			STATE FISCAL 1979		
	Manyrs.	Output	Budget	Manyrs.	Output	Budget	Manyrs.	Output	Budget
Permits Issued (New and Renewals)	2.92	500	55,549	6.35	837	123,865	7.52	726	172,316
NSPS Issued	—	—	—	.04	9	780	.32	12	7,333
PSD Issued	—	—	—	.04	3	780	1.56	6	35,746
Region Reviews of Permits	1.26	599	23,970	1.24	593	24,188	7.18	714	164,525
Tax Certifications Issued	.48	100	9,131	1.98	100	38,622	1.92	74	43,996
Region Review of Tax Certifications	.06	85	1,141	.05	82	975	1.61	199	36,892
New Source Impact Analysis	1.76	48	33,482	2.45	46	47,791	2.29	36	52,473
Review of DOT Projects	.24	24	4,566	.24	15	4,682	.24	12	5,499
Total	6.72	1,356	127,839	12.39	1,685	241,683	22.64	1,776	518,780

Source: State of North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Program Plan for FY 77, 78, and 79. Booz, Allen & Hamilton developed the budget estimates.

that is the number of permit actions to be taken. In interpreting the table, it is important to note that the data reflects issuance of both new permits and permit renewals. However, the procedures for permit renewals differ significantly from the procedures described above, and since the renewal process is part of the agency's continuing compliance strategy, it is discussed in a different section of this report.

The table shows that the FY 1979 permitting budget increased by $390,941 or 305 percent. At the same time, the man-years devoted to permitting activities increased by 236 percent from 6.72 to 22.64. During that period, however, the total number of outputs from all permitting program activities rose only 30 percent. These figures may reflect the shift in activity from issuance of initial permits to renewal of permits. Unlike the process followed in issuing the original permit, permit renewals require the site inspections which are time consuming.

As further indication of the number of sources subject to the permitting procedures each year, agency staff members compiled a profile of actual permit actions for a representative one-year period. This profile showed that between April 1, 1977 and March 1, 1978, the agency received 465 applications for new permits, on which the agency took the following actions.

.	Permits granted	400
.	Permits denied	2
.	Permit applications held due to incompleteness	46
.	Permits not required	14
.	Amendments to existing permits	2
.	Review and recommendation in support of local permitting	1

(7) Surveillance and Monitoring

Historically, the agency has had two different approaches for surveillance and monitoring during the precompliance or construction phase. For sources which received temporary permits between 1971 and 1975 or subsequently received special orders by consent (SOC), the regional offices conducted site visits to determine source compliance with the schedules established. For sources which, based on the agency's judgment that the proposed control plan would meet emission and ambient requirements, received permits without stipulations, essentially the only surveillance conducted is to determine when the production process and control equipment goes on line. The absence of any other significant surveillance and monitoring effort reflects the fact that the source does not receive a separate construction permit. Rather, prior to construction the source receives a permit establishing final emission limitations. Typically, the source must demonstrate compliance within 60-90 days after operations commence. The procedures for both compliance demonstrations and continuing compliance surveillance are described in the following section on postcompliance programs.

2. POSTCOMPLIANCE PROGRAMS

The DEM has several mechanisms available to it for encouraging sources to adopt good O&M practices and to remain in compliance with emission limitations. This section of the report attempts to provide an overview of the extent to which the agency utilizes these mechanisms. It therefore describes the operation of and resources devoted to the following postcompliance phase programs:

- Demonstration of compliance
- Surveillance and monitoring
- Permit renewals
- Enforcement strategies.

(1) Demonstration of Compliance[1]

Typically, a source has between 60 and 90 days after commencing operation to demonstrate compliance, and, depending on requirements set forth in the permit, can do so in one of three ways:

- Source test (i.e., stack test)
- Visible emissions test
- Engineering evaluation

---

[1] The procedures described here also are used for monitoring continuing compliance. Therefore, the resources for both programs are presented together.

During the one year period, April 1, 1977 to March 31, 1978, of the 400 sources permitted, 67.5 percent demonstrated compliance solely through an agency-conducted engineering evaluation, 25 percent used a visible emissions evaluation supplemented by an engineering evaluation, and 7.5 percent used a source or agency conducted source test. The following paragraphs describe each method.

1. Source Testing

As required or authorized by either Federal or state regulations, the permits of some sources require a satisfactory source (stack) test as evidence of compliance with emissions limitations. In requiring a source test, the agency can specify the production conditions under which the test is conducted. Typically, a source hires a consulting engineer or firm to conduct the test and related analysis and prepare the required report. A representative of the agency's source testing unit usually observes the test.

Figure V-2, on the following page, depicts two different avenues of source/agency interaction with respect to the source test. In the first case, the role of the source testing unit is limited to observing the test, and reviewing and accepting the submitted source test.

The figure shows that in the second case, the source testing unit does not approve the source test report. In that circumstance, the agency again has two options. Under the first option, the regional office recommends that the source itself conduct a new source test. The source usually contracts with a new firm to conduct the retest and submits a new report to the source testing unit. Under the second option, the agency itself conducts the retest. Typically either a staff member from the regional office or the source testing unit conducts a pretest site survey in order to determine the equipment and technical preparations necessary to conduct the test. Based on this survey, the source testing unit requests that the source operator make the necessary preparations and arranges a date for the source test.

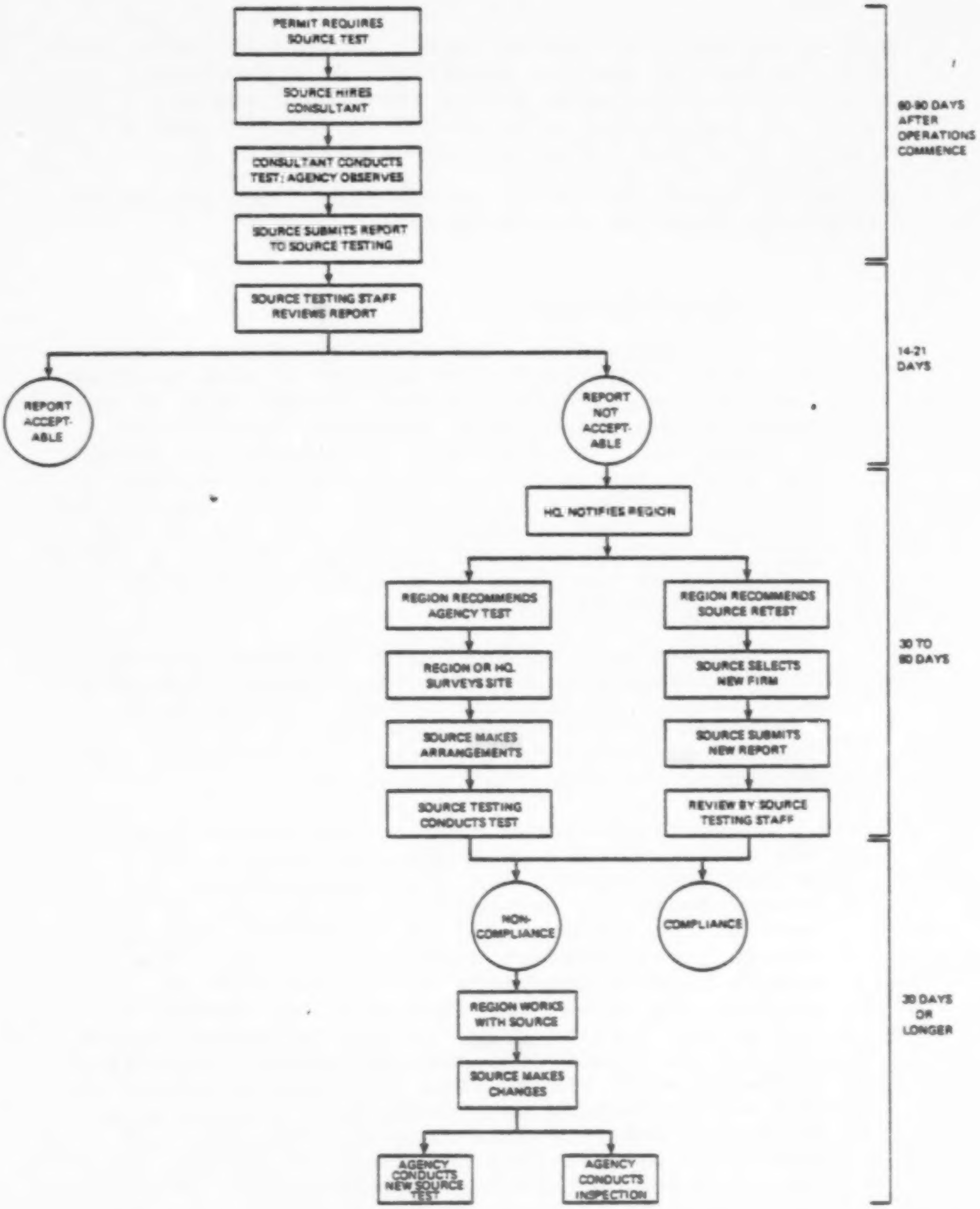

PERMIT REQUIRES SOURCE TEST
SOURCE HIRES CONSULTANT
CONSULTANT CONDUCTS TEST; AGENCY OBSERVES
SOURCE SUBMITS REPORT TO SOURCE TESTING
SOURCE TESTING STAFF REVIEWS REPORT
REPORT ACCEPTABLE
REPORT NOT ACCEPTABLE
HQ. NOTIFIES REGION
REGION RECOMMENDS AGENCY TEST
REGION OR HQ. SURVEYS SITE
SOURCE MAKES ARRANGEMENTS
SOURCE TESTING CONDUCTS TEST
REGION RECOMMENDS SOURCE RETEST
SOURCE SELECTS NEW FIRM
SOURCE SUBMITS NEW REPORT
REVIEW BY SOURCE TESTING STAFF
NON-COMPLIANCE
COMPLIANCE
REGION WORKS WITH SOURCE
SOURCE MAKES CHANGES
AGENCY CONDUCTS NEW SOURCE TEST
AGENCY CONDUCTS INSPECTION
60-90 DAYS AFTER OPERATIONS COMMENCE
14-21 DAYS
30 TO 60 DAYS
30 DAYS OR LONGER

FIGURE V-2
Source Testing Procedures for Demonstration of Compliance

Exercise of either of the two options, of course, can result either in the source demonstrating compliance or failing to demonstrate compliance. In those cases where the source is not in compliance, the agency notifies the source by letter and requests that the source submit a control plan and schedule within 30-60 days. Typically, staff members from the region work with the source staff to develop the control plan. Once the source adopts the necessary changes, the agency requires a demonstration of compliance, although not necessarily a source test.

An example of a successful interaction between source and agency was the case of a company which mines rock and separates, washes, grinds and dries the mica from that rock. Approximately three years ago, the source hired an engineering firm to do a source test on a homemade scrubber. A staff member from the source testing unit observed the test. During the test, water and mica fell on the engineer conducting the test, clearly indicating improper functioning of the scrubber and thus noncompliance. The firm which conducted the test also had an interest in selling control equipment and convinced the source to purchase a new scrubber and cyclonic separating device. The regional office, satisfied that the source would be in compliance, removed the stipulation for a source test. However, the source operator wanted to test the new equipment and convinced the region to recommend a test by the state. The state conducted the test, which showed the source to be in compliance.

In a second case, a cotton gin was very uncooperative both with regard to the conduct of a test and to the adoption of pollution controls. All the gins in the state, except one company, had agreed to install a particular type of cyclone. The single company refused to invest in the equipment since it operated only six days per year. A staff member of the source testing unit conducted a pretest type survey and requested that the company provide and install duct extensions for the test. The company provided some extensions under protest but the source testing unit staff had to install them. Although the test showed the company to be in serious violation, the source continued to refuse to install control equipment. According to interview data, the state has not taken enforcement action.

2. Visible Emissions Evaluations

Sources subject to the visible emission control regulations described in Chapter IV can demonstrate compliance by passing an agency conducted visible emissions test. To assure the accuracy of their observations, all regional and headquarters professional staff members are required to attend a smoke school and to receive certification in visible emissions evaluation. They must renew this certification every six months. At the school, staff members learn to recognize varying shades or densities of emissions, as measured according to categories in the Ringelmann chart. Within 60-90 days of a source commencing operation, a regional staff member drives by the plant and visually observes the shade or density of the emissions.

The regional staff member supplements his visible emission evaluation with an inspection of the control equipment. Often, the results of the visible emission evaluation will determine the detail with which the inspection is conducted.

3. Engineering Evaluation

The third method of compliance demonstration consists of an agency inspection of the plant. This inspection ascertains that the source has installed and commenced operation of either the required or more stringent controls. As noted in the introductory discussion on compliance demonstration, during an example one-year period, 67.5 percent of the sources demonstrated compliance through an engineering evaluation only. For the remaining 32.5 percent, the agency supplemented source tests and visible emissions evaluations with an engineering evaluation.

(2) Surveillance and Monitoring

Several mechanisms are available to the agency staff for tracking source continuing compliance with emission standards, permits, and SOCs. These include:

- Source testing
- Visible emissions evaluations
- Engineering evaluations/Site inspections
- Complaint investigations
- Fuel sample analysis
- Professional consultations
- Permit follow-up investigations

From a technical viewpoint, the first three mechanisms are identical to the ones used to demonstrate compliance. However, from a procedural viewpoint, they differ. These differences in procedures as well as the use of the other two mechanisms are outlined in the following paragraphs.

1. Source Testing

As a tool for monitoring continuing compliance, only the source testing group, rather than the source and/or the source testing group, conducts the source tests. At the beginning of each fiscal year, the regional staffs identify particularly troublesome cases to be tested by the source testing group. The regional staffs transmit these requests to the head of the source testing group who establishes a schedule for the year. If manpower resources are insufficient to handle the requested volume of source tests, the source testing staff negotiates with the regional staffs to hold some of the tests the following year. Once the source testing group establishes a schedule, the procedures followed are identical for the agency conducted source tests described under compliance demonstration. Interview data indicated that the agency conducts approximately 75-100 source tests annually for the purpose of determining continuing source compliance.

2. Visible Emissions Evaluations

The regional staff members are responsible for conducting visible emissions evaluations. Typically, a staff member will conduct the evaluation during a planned engineering evaluation visit. However, the staff member will also conduct a visible emissions evaluation as part of a complaint inspection, a followup inspection on a previously detected violation, or during any ride past a source which appears to be in violation.

3. Engineering Evaluations

According to SIP, all sources in the state are subject to an inspection at least once every two years. In actuality, at the beginning of each fiscal year each region develops a schedule which is supposed to result in either quarterly, biannual, or annual inspections. The region determines the inspection frequency on the basis of the source's size and past performance. Typically, the evaluation is supposed to consist of a process review, including data on the existing and planned production capacity, practices for operating and maintaining emission control deivces, and procedures for operating, maintaining and calibrating monitoring equipment. The source performance evaluations being conducted for Task II of this project will provide some insights as to the thoroughness of agency inspections as well as source supplied data on which the agency evaluations are based.

Upon completion of the inspection, the staff member prepares a report which he transmits to the source operator. The report summarizes the evaluation's findings and in some cases makes recommendations. Where the agency recommends corrective actions, a regional staff member conducts a follow-up investigation.

4. Complaint Investigations

The agency has yet another opportunity to track continuing compliance when it receives a complaint. When headquarters receives such a

---

1 State of North Carolina, Department of Natural Resources and Community Development, Division of Environmental Management, Program Plan for Period July 1, 1978 to October 1, 1979, Attachment "A" Summary of Previous Years Effort, Raleigh, North Carolina.

2 Ibid, Program Plan for Period July 1, 1977 to October 1, 1978, p. 53.

complaint, a "Request for Action to be Taken" is prepared and sent to the appropriate regional air quality engineer. This engineer assigns a staff member to conduct an investigation. Typically, the complaints are for smoke or odor and the staff member conducts a visible emission evaluation. He may supplement this with an inspection of the plant and interviews with plant personnel. The investigator prepares a report of his findings and recommendations and transmits it to the field operations chief. The source receives notification of any recommended corrective measures, and the complainant receives copies of all reports and correspondence. Where corrective actions are recommended, a regional staff member conducts a follow-up inspection to determine compliance. Table V-5 shows the number of complaints investigated between 1972 and 1978.

5. Fuel Sample Analysis

As Chapter IV pointed out, the SIP anticipated that both existing and new sources might use low sulfur coal to comply with SO_2 controls. Therefore, as part of its program to monitor continuing compliance, the agency established a program for analyzing fuel sulfur content. Under this program, the monitoring unit of the Air Quality Section conducts analyses on approximately 200 representative samples of fuels annually to determine BTU content and percent sulfur content. In addition, the agency expects sources to maintain records of the BTU and percent sulfur content of all the fuel used throughout the year.

6. Professional Consultations

One way in which agency personnel implement the voluntary compliance policy is to provide technical assistance to source operators in the form of "professional consultations." Typically, a professional consultation involves the regional staff assisting the source staff in developing, selecting, and implementing a control plan. Thus, professional consultations occur in connection with the source preparation or agency review of a permit application, source response to an informal or formal notification of a violation detection, and source/agency negotiation on SOCs. The exact nature

TABLE V-5

COMPLAINT INVESTIGATIONS

1972[1]	748
1973[2]	1239
1974[3]	722
1975[4]	N/A
1976[5]	480
1977[5]	538
1978[5]	455

---

[1] Data from first semi-annual report to EPA, covering only the second half of calendar 1972.

[2] Data from second and third semi-annual reports to EPA covering calendar 1973.

[3] Data from final semi-annual report to EPA, covering only the first half of calendar 1974.

[4] Data not included in FY '75 quarterly reports to EPA and unobtainable from agency sources.

[5] Data for fiscal years, contained in "Analysis of Previous Years Effort" section of FY '77, '78, and '79 program plans.

and frequency of use of this mechanism varies among regional offices.

7. Permit Follow-up Investigations

Although listed in quarterly reports and program plans as a distinct type of inspection, the permit follow-up investigations may take the form of a cursory site inspection, visible emissions evaluation, or detailed engineering evaluation. They are listed separately because they typically are conducted specifically to determine whether a violation detected earlier, but one which did not result in a formal enforcement action, has been corrected.

* * * *

The remainder of this section on surveillance and monitoring presents some data on planned outputs and budget resources as well as data on actual levels.

Table V-6, on the following page, shows the agency's planned outputs and manyear effort for FY 77, 78, and 79. Based on that data, budget resources were estimated and included in the table. These estimates show that a 39.8 percent budget increase accompanied a 10.9 percent manpower increase and 59.3 percent decrease in outputs. Specifically, agency outputs decreased in the following areas:

- SOC compliance inspection
- Ambient monitoring
- Permit follow-ups
- Fuel sampling.

The planned decreases in these areas were only slightly offset by planned increases in:

- Visible emissions tests
- Source tests
- NSPS, NESHAPS, and PSD compliance inspections.

Table V-7 presents actual activity level data for 1973 through 1978. It appears to show a reduction in all areas except engineering evaluations and professional consultations. However, for the following reasons, the data on actual outputs is sufficiently unreliable

TABLE V-6
Monitoring Program Activities
Fiscal Years 1977, 1978, 1979

PROGRAM ACTIVITY	STATE FY 1977			STATE FY 1978			STATE FY 1979		
	Manpower	Outputs	Budget	Manpower	Outputs	Budget	Manpower	Outputs	Budget
Ambient Monitoring and Special Studies	5.10	6937	100,826	5.36	1123	112,157	6.75	298	156,627
SIP Inspections	16.27	8283[1]	309,517	8.13	1230	162,000	6.73	1620	156,731
Engineering Evaluation Inspections	—	—	—	5.30	2207	108,908	7.45	5063	160,834
Compliance with SOCs	1.65	889	38,589	5.12	683	99,071	1.06	220	26,709
Permit Follow-ups	3.75	2392	71,334	5.08	2707	111,917	4.79	1001	109,360
Compliance with NSPS, NESHAPS, PSD	—	—	—	.06	15	1,130	.20	27	6,016
Fuel Sampling	.23	263	4,175	.17	229	7,217	.16	199	3,666
Visible Emissions Evaluations	—	—	—	3.12	300	71,007	3.32	120	80,267
Source Tests Conducted	2.00	40	58,709	4.09	82	79,701	4.61	83	101,580
Source Tests Observed	1.03	82	32,063	.03	11	15,000	.63	25	13,978
Gas Certification Inspection	.05	11	951	.70	76	15,600	1.50	71	36,016
Quality Assurance	.60	—	12,175	1.20	—	28,900	1.27	—	27,955
Equipment Maintenance	1.92	880	36,536	2.92	322	57,936	3.35	100	76,363
Other Monitoring	—	—	—	.10	—	3,511	—	—	
Update of the Priority Source File	—	—	—	—	—		.05	—	19,677
Total	36.53	17,093	663,779	37.30	11,063	821,717	[illegible]	[illegible]	[illegible]

[1] Includes both point and area sources

Source: State of North Carolina, Department of Natural Resources and Community Development, Division of Environmental Management, Program files FY 1977, 1978, 1979.
Budget estimates by Booz, Allen & Hamilton.

TABLE V-7
Inspection Activities 1973 - 1978

TYPE INSPECTION	1973	1974[1]	1975	1976	1977	1978
Visible Emissions	485	222	120	250	384	151
Site Inspection	6889	3592	417	462	397	874
Engineering Evaluation	N/A	N/A	1348	7269	5471	6939
Professional Consultations	9735	4512	921	4553	4964	5144
Surveillance	N/A	N/A	N/A	84	N/A	N/A
Complaint Investigations	1239	722	N/A	480	538	455
Follow-up Inspections	N/A	N/A	110	501	626	357
Source Tests	11	14	34	23	54	48

Sources: For calendar 1973 and 1974, semi-annual reports to EPA; for FY 75 and 76, quarterly reports to EPA; for FY 76, 77, 78 the "Analysis of Previous Years Effort" contained in annual program plans.

---

[1] Represents ½ calendar year; remaining activities displayed in FY 75 figure.

either to compare actual versus planned outputs or to clearly define program trends. First, between 1973 and 1978, reporting to EPA shifted from a calendar year basis to a quarterly basis. The shift occurred in mid 1975, explaining what appears to be, but is not, an unusually low activity level in 1975. Second, the semi-annual and quarterly reports to EPA, according to interview data, undercount the actual level of agency outputs. This is because although a regional inspector in one day may conduct a visible emission evaluation, site inspection, and professional consultation at a given source, EPA reporting procedures requires that those activities be counted as one inspection rather than three. However, the figures reported in the "Analysis of Previous Years Effort" section of the three available annual program plans counts all procedures conducted. Finally, over the years, the reporting categories appear to have changed somewhat. For example, FY 1976 was the only year in which reports to EPA used the category "surveillance." Similarly, the term "engineering evaluation" was not used until FY 1975.

(3) Permit Renewals

The DEM issues permits for a 3-5 year period, after which the source must apply for a renewal. Figure V-3, on the following page, illustrates that the agency's permit renewal procedures differ from its new permit procedures.

The process begins with a source request for a permit renewal. In this request, the source must state that its production process has not changed significantly from the description submitted in the initial permit request. The permits staff in headquarters transmits the renewal request to the appropriate regional engineer who assigns a staff member to conduct an engineering evaluation. During the inspection, the investigator attempts to ascertain whether the source's production characteristics have changed and whether the source is operating in compliance with emission standards and permit requirements. The investigator files a report containing findings and recommendations with the permits chief at headquarters.

The process continues with a multi-step review at headquarters. First, a review engineer evaluates the regional staff's recommendations and adds his own recommendations. This review process is repeated until the permits chief, technical services chief, and air

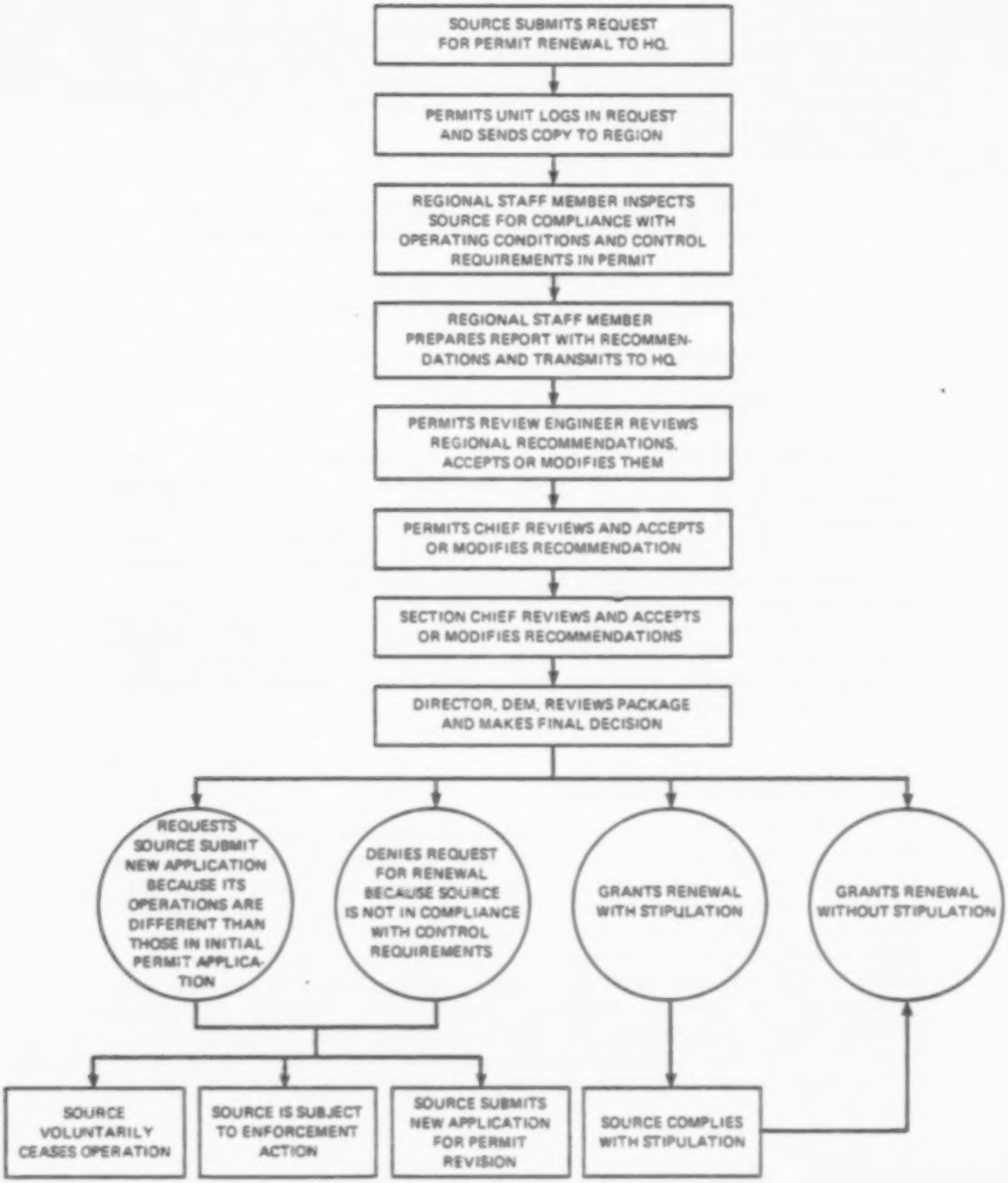

SOURCE SUBMITS REQUEST FOR PERMIT RENEWAL TO HQ.
PERMITS UNIT LOGS IN REQUEST AND SENDS COPY TO REGION
REGIONAL STAFF MEMBER INSPECTS SOURCE FOR COMPLIANCE WITH OPERATING CONDITIONS AND CONTROL REQUIREMENTS IN PERMIT
REGIONAL STAFF MEMBER PREPARES REPORT WITH RECOMMENDATIONS AND TRANSMITS TO HQ.
PERMITS REVIEW ENGINEER REVIEWS REGIONAL RECOMMENDATIONS, ACCEPTS OR MODIFIES THEM
PERMITS CHIEF REVIEWS AND ACCEPTS OR MODIFIES RECOMMENDATION
SECTION CHIEF REVIEWS AND ACCEPTS OR MODIFIES RECOMMENDATIONS
DIRECTOR, DEM, REVIEWS PACKAGE AND MAKES FINAL DECISION
REQUESTS SOURCE SUBMIT NEW APPLICATION BECAUSE ITS OPERATIONS ARE DIFFERENT THAN THOSE IN INITIAL PERMIT APPLICATION
DENIES REQUEST FOR RENEWAL BECAUSE SOURCE IS NOT IN COMPLIANCE WITH CONTROL REQUIREMENTS
GRANTS RENEWAL WITH STIPULATION
GRANTS RENEWAL WITHOUT STIPULATION
SOURCE VOLUNTARILY CEASES OPERATION
SOURCE IS SUBJECT TO ENFORCEMENT ACTION
SOURCE SUBMITS NEW APPLICATION FOR PERMIT REVISION
SOURCE COMPLIES WITH STIPULATION

FIGURE V-3
Permit Renewal Procedures

quality section chief all have made recommendations. The air quality section then transmits the entire package to the Director of the Division of Environmental Management. Only the Director has the authority to issue decisions, and his decisions can take any of the following four forms:

- Source must file new permit application due to significant operational changes
- Source receives short extension accompanied by requirement for corrective action
- Source receives renewal without stipulation
- Source request is denied.

During the period April 1, 1977 to March 1, 1978, the agency received 275 renewal requests of which 89 percent (245) resulted in renewals without stipulation and 3.6 percent (10) resulted in short term renewals. Of the remaining 30, the agency returned 5 because the regulations no longer required these sources to have permits and held over 25 because the agency had not yet conducted the necessary inspection. If the EMC denies the source's application for a permit or renewal, the source can appeal using the procedures shown in Figure V-4 on the following page.

(4) Enforcement Strategy

The EMC has promulgated a post-attainment policy directing the air quality staff to pursue with sources all avenues for fostering voluntary compliance before seeking civil penalties. In order to lay the foundation for evaluating the effectiveness of this policy, this section first reviews the types of violations which sources can and do commit and then discusses the frequency of use of various enforcement tools. It concludes with a summary of the manpower and budget resources the Air Quality Section planned to devote to enforcement activities during fiscal years 1977, 1978, and 1979.

1. Types of Violations

Under the regulations described in Chapter IV, sources can commit the following six types of

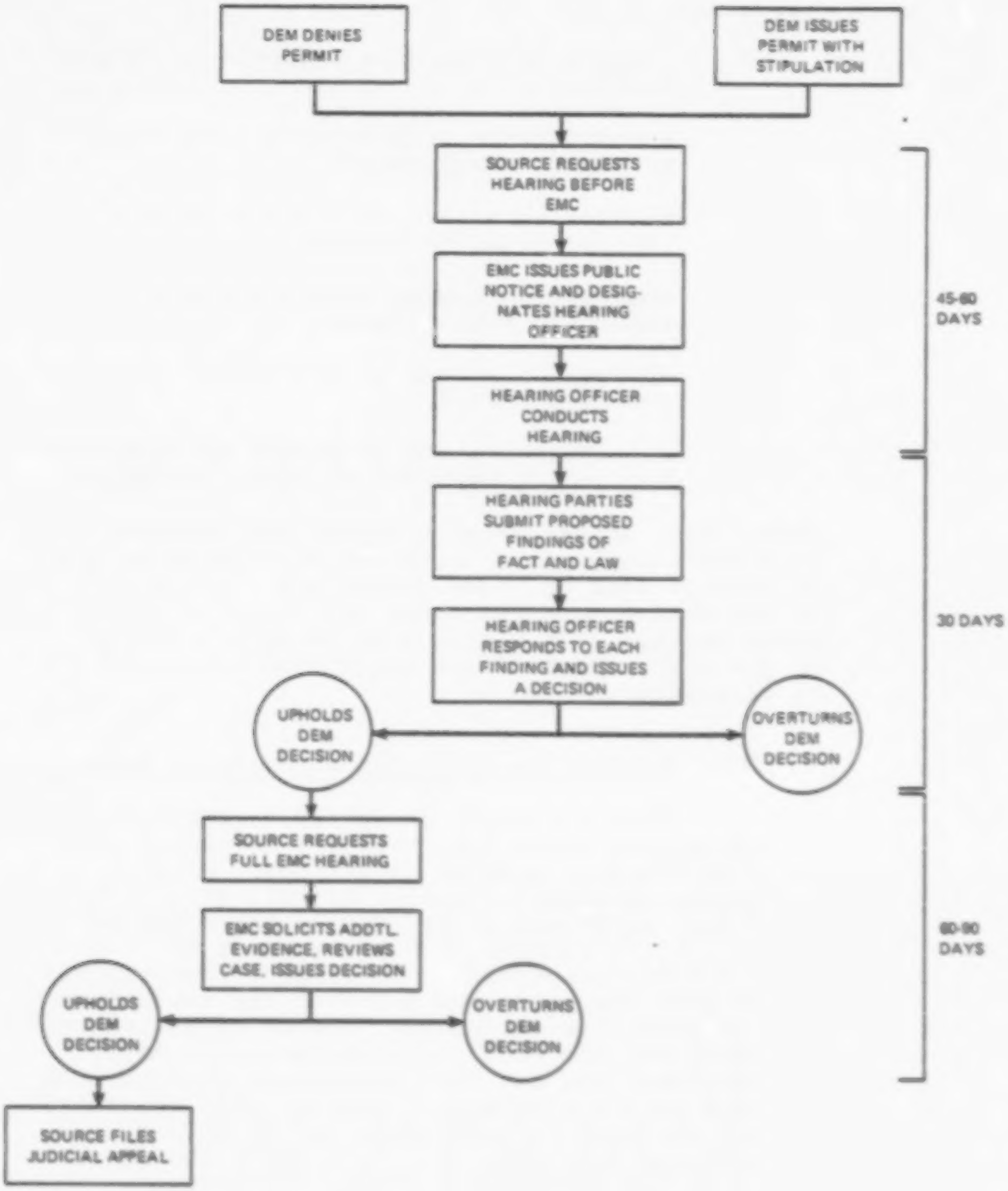

DEM DENIES PERMIT
DEM ISSUES PERMIT WITH STIPULATION
SOURCE REQUESTS HEARING BEFORE EMC
EMC ISSUES PUBLIC NOTICE AND DESIGNATES HEARING OFFICER
HEARING OFFICER CONDUCTS HEARING
45-60 DAYS
HEARING PARTIES SUBMIT PROPOSED FINDINGS OF FACT AND LAW
HEARING OFFICER RESPONDS TO EACH FINDING AND ISSUES A DECISION
30 DAYS
UPHOLDS DEM DECISION
OVERTURNS DEM DECISION
SOURCE REQUESTS FULL EMC HEARING
EMC SOLICITS ADDTL. EVIDENCE, REVIEWS CASE, ISSUES DECISION
60-90 DAYS
UPHOLDS DEM DECISION
OVERTURNS DEM DECISION
SOURCE FILES JUDICIAL APPEAL

FIGURE V-4
Procedures for Appealing Permit
Or Permit Renewal Decisions

violations:

- Failure to apply for a permit or permit renewal
- Noncompliance with emission standards or permit requirements
- Failure to adhere to a schedule in a special order by consent
- Noncompliance with monitoring and reporting requirements
- Refusal to access to the EMC or its representatives
- Misrepresentation on permit applications, monitoring reports, or other documents.

Interviews, annual program plans, and quarterly progress reports filed with EPA are the principal sources of data on these violations. Table V-8, on the following page, shows the types of violations between 1975 and 1978 which were referred to the enforcement office for consideration of a civil penalty.

(1) Failure to Apply for a Permit or Renewal

This violation is fairly susceptible to detection since the state has developed and periodically updated an inventory of all point sources. Although not all of 12,375 known major and minor sources are required to obtain permits, all are subject to periodic inspection. Therefore, the regional staffs typically are aware of any violations of permit requirements. According to interview data and the FY 79 program plan, all major sources have met the requirement to apply for and obtain a permit. However, only one-third of the minor sources required to obtain permits have done so. As a rule, the agency does not institute a formal enforcement proceeding against a violator in this category. Rather, it pursues a policy of voluntary cooperation by soliciting

TABLE V-8

Violations for Which Regional Inspectors Recommended Penalties

TYPE VIOLATION	1975	1976	1977	1978	TOTAL
Spray Painting	1	-	-	-	1
Open Burning	5	1	1	-	7
Permit Reg. Violation	1	-	1	-	2
Emission Standards	2	1	1	3	7
Visible Emissions	2	-	4	1	7
Permit Provisions	1	3	-	3	7
SOC	1	10	4	1	16
Air Quality Standards	-	1	-	1	2
TOTAL	13	16	11	9	49

Source: Civil penalties notebooks entitled "Air Quality Enforcement Actions" prepared by Office of Enforcement.

applications from sources and assisting the sources in developing control plans and completing the required forms.[1]

(2) Noncompliance with Emission Standards or Permit Requirements

The previous discussion on continuing compliance surveillance identified the various procedures which the agency uses to detect this category of violations. According to the FY 79 program plan, only 35 major sources (3.7%) fall into this category and all are on compliance schedules (consent orders) to correct the violations. The program plan for FY 79 shows 94 minor sources, or less than 1 percent, to be in noncompliance at the start of the year. However, given the inadequacies in agency recordkeeping practices documented in Chapter III, at any given moment in the fiscal year, the agency will not have an overview of the number of sources which have returned to compliance and those which have fallen out of compliance.

(3) Failure to Adhere to Compliance Schedules

Sources in North Carolina have been subject to two different sets of compliance schedules. Between 1971 and 1975, sources requiring permits but unable to meet emission standards received temporary permits which contained compliance schedules. On July 1, 1975, approximately 120 sources were still unable to meet emission standards and permit requirements. The agency issued special orders by consent (SOCs) which contained schedules to these sources.

As with the previous category of violations, data sources are conflicting regarding the actual number of violations detected. Specifically, the last three program plans indicate that all sources on schedules are meeting their schedules. However, the quarterly report for July 1, 1977 through September 30, 1977 shows at least eight major sources which missed increments during that quarter.[1]

---

[1] Table V-6 shows that between 1975 and 1978 only two cases of failure to apply for a permit were referred to enforcement.

(4) Noncompliance with Monitoring and Reporting Requirements

State regulation, as noted above, specifies the type of monitoring equipment or monitoring method as well as frequency of monitoring for which various categories of sources are responsible. In addition, the data from these monitoring activities must be reported in a manner and with a frequency required by the air quality permit. Violations can include the failure to conduct monitoring and submit reports, the filing of late or inaccurate reports. As noted below, deliberate falsification of reports constitutes a violation of the Water and Air Resources Acts.

No published data appears to be available on the frequency of this category of violations. However, the Task II source evaluations which have been conducted to date suggest that not only do the sources not maintain adequate records but the agency does not appear to have required corrective measures.

(5) Refusal of Access and Misrepresentation

State law authorizes the Environmental Management Commission or its representatives, usually from the Air Quality Section, to enter the premises of a source in order to collect data so as to ascertain air quality or compliance with permits. Source operators or owners face penalties for denying government representatives such access.

---

[1] Typically, special orders by consent contain up to five increments, or steps, which must be met by specific dates.

Misrespresentation or falsification is prohibited by the Water and Air Resources Act and is subject to a fine. Typical violations may include misrepresentation in registration documents, permit applications, or monitoring reports. There does not appear to be any data on either of these two violation categories.

2. Enforcement Mechanisms

The six procedures available to the agency for fostering a return to compliance are:

- Notices of violation
- Abatement orders
- Special order by consent (SOC)
- Special order without consent
- Civil penalties
- Criminal proceedings.

Table V-9, on the following page, presents the frequency of use of each mechanism between 1975 and 1978, and the following paragraphs describe the state's policy and procedures for their use.

(1) Notices of Violation (NOVs)

NOVs issued by the state are letters sent to source operators informing the source operator that the agency has detected a violation. Typically, the NOV also requests that the source submit a proposed control plan within 60-90 days of receipt of the NOV. Table V-9 shows that NOVs are a frequently used tool for fostering a return to compliance. However, discussions with regional inspectors during the conduct of Task II suggest that NOVs are not issued in connection with all detected violations. In many cases, the inspectors and source operators mutually resolve the violation without maintaining any record of its detection.

TABLE V-9

Enforcement Mechanisms: Frequency of Use FY 1975-1978

MECHANISM	1975	1976	1977	1978
NOVs	243	135	N/A	65
Abatement Orders	N/A	N/A	N/A	5
SOCs	0	150	24	7
Special Orders without consent	0	0	0	0
Civil Penalty[1]	4	10	2	4
Criminal Proceeding	0	0	0	0

Sources: For NOVs and abatement orders, quarterly reports to EPA; for SOCs, "Special Order List" prepared by DEM; for civil penalties, files of Office of Enforcement.

---

[1] Civil penalty data is by calendar year; other data is by fiscal year.

(2) Abatement Order

Following detection of a violation and notification to the source of the violation, the agency can seek to prevent the continuation of the violation by issuing an abatement order. The effect of this order is to require the source either to cease the emission violation by installing or improving the operation of control equipment or by shutting down. This is an infrequently used mechanism.

(3) Special Order by Consent (SOC)

In 1975, the DEM adopted a post-attainment policy which identified sources eligible for special orders by consent (SOCs). Figure V-5, on the following page, depicts the process by which which the state negotiates SOCs with these sources. Typically, issuance of an NOV coupled with a request for a control plan is the step which initiates the process. Once the source and the state have reached agreement on the schedule to be contained in the order, the state must forward those dealing with SO_2 and particulate violations to EPA Region IV for approval. The DEM Director makes final decisions on the SOCs, subject to EMC approval. No public hearing is held for SOCs.

SOCs have been a relatively frequently used enforcement tool, with over 200 having been issued between 1975 and 1978. Table V-10 shows the number issued each year during that period as well as the number expected to come into compliance each year. In order to evaluate the effectiveness of this enforcement mechanism both a review of published data and a sampling of the raw files was conducted to determine the extent to which sources fail to meet their scheduled complaince dates. In FY 1975 and 1976, according to quarterly reports, 188 sources and 51 sources respectively rescheduled thosed dates. Of the 28 sources subject to a file review, 18 had met or were on schedule with their final compliance dates. Two clearly had missed their final compliance dates, and for the remainder the file contained no data on compliance status.

TABLE V-10

Overview of SOC Activity

ACTION	1976	1977	1978	1979	TOTAL
SOCs Issued	150	24	7	N/A	181
Scheduled Compliance	106	60	13	2	181

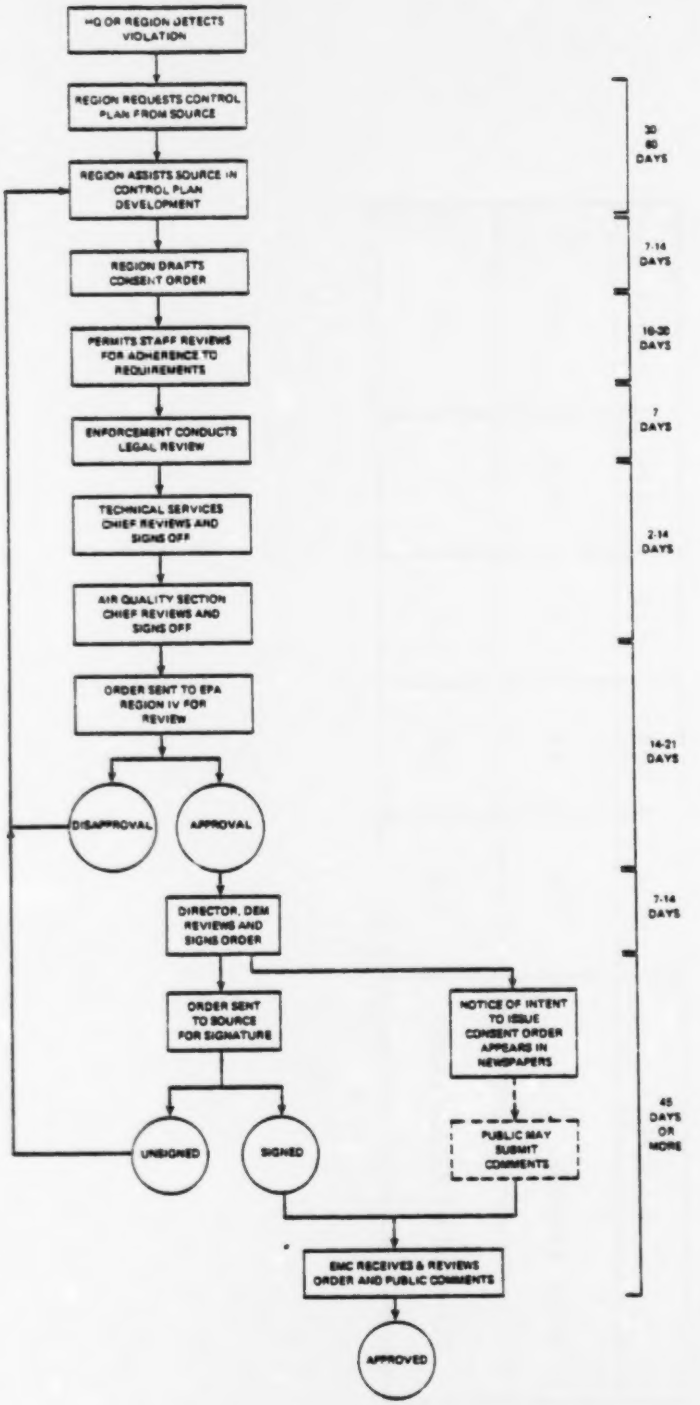

HQ OR REGION DETECTS VIOLATION
REGION REQUESTS CONTROL PLAN FROM SOURCE
REGION ASSISTS SOURCE IN CONTROL PLAN DEVELOPMENT
REGION DRAFTS CONSENT ORDER
PERMITS STAFF REVIEWS FOR ADHERENCE TO REQUIREMENTS
ENFORCEMENT CONDUCTS LEGAL REVIEW
TECHNICAL SERVICES CHIEF REVIEWS AND SIGNS OFF
AIR QUALITY SECTION CHIEF REVIEWS AND SIGNS OFF
ORDER SENT TO EPA REGION IV FOR REVIEW
DISAPPROVAL
APPROVAL
DIRECTOR, DEM REVIEWS AND SIGNS ORDER
ORDER SENT TO SOURCE FOR SIGNATURE
NOTICE OF INTENT TO ISSUE CONSENT ORDER APPEARS IN NEWSPAPERS
UNSIGNED
SIGNED
PUBLIC MAY SUBMIT COMMENTS
EMC RECEIVES & REVIEWS ORDER AND PUBLIC COMMENTS
APPROVED
30 60 DAYS
7-14 DAYS
10-30 DAYS
7 DAYS
2-14 DAYS
14-21 DAYS
7-14 DAYS
45 DAYS OR MORE

FIGURE V-5
Source-Agency Negotiation of Special Orders
By Consent (SOCs)

(4) Special Order Without Consent

The DEM has authority to issue a special order without consent if sources eligible for an SOC refuses to enter into one. In the case of a special order, the state establishes the compliance schedule with the source. In addition, the state must ask EPA to issue a Section 114 letter, and the state must conduct a public hearing.

(5) Civil and Criminal Penalties

The Water and Air Resources Acts authorize a variety of sanctions ranging from permit revocation to civil and criminal fines to prison terms. These are enumerated below:

- For violation of standards, limitations, special orders, reporting requirements, or denial of access to EMC, the civil penalty is not more than $5000.
- Willful violations are subject to a civil penalty of no more than $5000 per day for the duration of the violation.
- Criminal violations (willful or negligent) of standards, limitations, special orders or other EMC regulations constitute misdemeanors punishable by a fine not to exceed $25,000 per day of violation, imprisonment not to exceed six months, or both.
- Misrepresentation and data falsification is a misdemeanor punishable by a fine not to exceed $10,000, imprisonment not to exceed six months, or both.
- A second conviction carries a fine or prison term twice the amount (i.e., $50,000 or $20,000).

It is the policy of the DEM to impose civil penalties on only those sources which have made little or no effort to comply with emission standards, permit requirements, or the compliance schedules on pre-1975 temporary permits. Criminal proceedings also are reserved for those sources which either violate special orders or have shown no cooperation in complying with air quality standards.

Figure V-6 shows the procedure the agency uses in imposing civil penalties. Responsibility for initiating the action typically rests with the regional staffs. They transmit their penalty recommendations to headquarters for review by the following:

- Field operations chief
- Technical services chief
- Air quality section chief.

The air quality section then sends the package to the enforcement staff for legal review and preparation of a decision memorandum. This memorandum, together with the air quality section recommendations, forms the basis for the DEM Director's decision. Sources can appeal to the EMC either by challenging the facts of the decision or requesting a penalty reduction due to mitigating conditions.

While civil penalties are infrequently used and usually are issued only after other mechanisms such as informal consultations, NOVs, or SOCs fail to bring about compliance, they are assessed relatively rapidly once the regional inspector makes a recommendation. As shown in Table V-11, interviews with enforcement staff members suggest that on the average approximately 9-12 weeks elapses between the time the regional inspector submits a report recommending a penalty and the time the Director of DEM signs off on the penalty. A review of eight specific cases showed an actual range of 2½ months to 5 months from the initial recommendations to actual issuance of a penalty. The cases also showed wide variations in how many violations were detected and whether compliance extensions were granted prior to

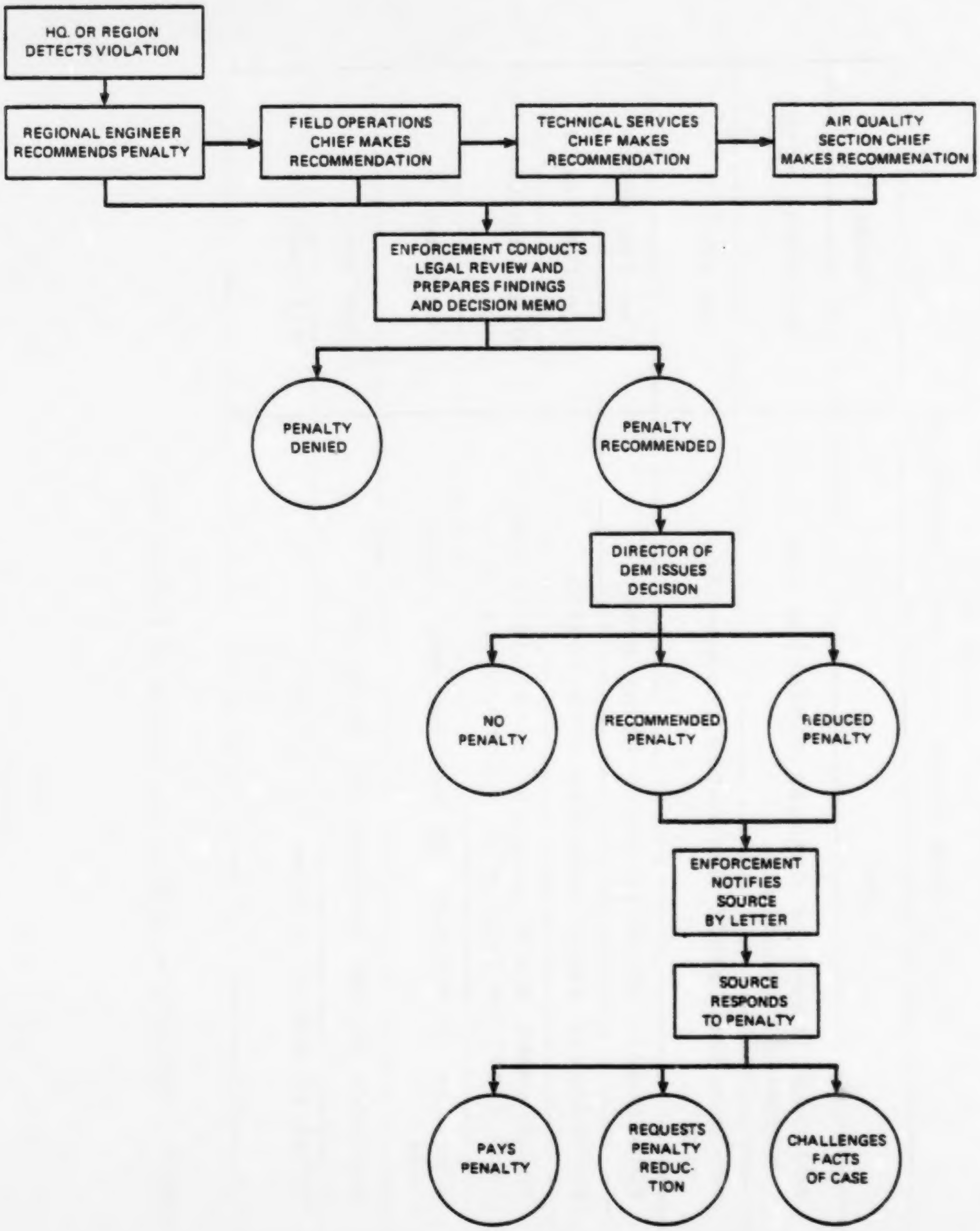

HQ. OR REGION DETECTS VIOLATION
REGIONAL ENGINEER RECOMMENDS PENALTY
FIELD OPERATIONS CHIEF MAKES RECOMMENDATION
TECHNICAL SERVICES CHIEF MAKES RECOMMENDATION
AIR QUALITY SECTION CHIEF MAKES RECOMMENATION
ENFORCEMENT CONDUCTS LEGAL REVIEW AND PREPARES FINDINGS AND DECISION MEMO
PENALTY DENIED
PENALTY RECOMMENDED
DIRECTOR OF DEM ISSUES DECISION
NO PENALTY
RECOMMENDED PENALTY
REDUCED PENALTY
ENFORCEMENT NOTIFIES SOURCE BY LETTER
SOURCE RESPONDS TO PENALTY
PAYS PENALTY
REQUESTS PENALTY REDUCTION
CHALLENGES FACTS OF CASE

FIGURE V-6
Civil Penalty Process

TABLE V-11
Time Frame for Civil Penalties

STEP	DURATION
Regional inspector detects violation and recommends penalty	Two-three weeks
Headquarters staff evaluates recommendation	One week
Enforcement staff prepares first draft	One-two weeks
Enforcement staff consults with region	One-two weeks
Enforcement staff prepares final decisions and findings memo with recommendations	Over one week
Director of Enforcement reviews and signs off	One week
Director of DEM reviews and signs off	One week
Total preparation time (average)	9-12 weeks

Source: Interview with Kirt Cox, Office of Enforcement initiation of the penalty action. Finally, the enforcement files do not note whether the imposition of a penalty resulted in correction of the violation.

Table V-12 shows that between 1975 and 1978 only 20, or about 20% of the cases referred to enforcement have resulted in civil penalties. In these relatively few cases in which the agency has exercised its authority, the penalties have been far below the statutory maximums enumerated above. Of the 20 cases resulting in civil penalties between 1975 and 1978, the penalties were as follows:

AMOUNT	NUMBER
$1500	5[1]
$1000	2
$ 800	1
$ 600	1
$ 500	7
$ 250	1
$ 200	2

The average penalty has ranged between $250 and $500, with an occasional penalty as high as $1500-$2000. In at least one case, the regional engineer's recommendation of a $5000 penalty for a utility was reduced by the DEM Director on the basis of the energy crisis.

Table V-13 displays the planned manpower and budget resources for air quality section enforcement activities together with outputs for three fiscal years.[2] It shows that between FY 77 and the current fiscal year, the enforcement activities budget rose by 269 percent and the level of effort devoted to those activities rose by 289 percent. Total outputs appear to have decreased by 20 percent. However, this decrease can be explained in three ways. First, the section's enforcement activities shifted from an emphasis on open burning violations to a concern with violations of emission standards, per-

---

[1] One $1500 penalty and the $800 penalty were rescinded by the EMC.

[2] Enforcement office also expends resources on related activities. However, the program plan data were incomplete.

TABLE V-12
Final Action on Cases Referred to Enforcement

FINAL ACTION	1975	1976	1977	1978	TOTAL
Civil penalty issued	4	10	2	4	20
Warning letter sent	0	1	1	1	3
SOC signed	3	0	0	0	3
Action deferred	0	0	3		3
No action taken	4	4	4	1	13
Source out of business	2	0	0	0	2
Case open	0	1	1	3	5
TOTAL	13	16	11	9	49

TABLE V-13
Enforcement Resources of Air Quality Section
Fiscal Years 1977, 1978, 1979

PROGRAM ACTIVITY (AIR QUALITY SECTION)	STATE FY 1977			STATE FY 1978			STATE FY 1979		
	Manyears	Output	Budget	Manyears	Output	Budget	Manyears	Output	Budget
Violations of SOCs or Permit Schedules	—	—	—	.03	12	585	.21	23	4,812
Violations of Emission Standards	.24	—	4,566	.20	8	3,901	.33	15	7,562
Open Burning Violations	.45	100	8,561	.26	33	5,072	.11	9	2,521
Actions Against NESHAPS Violators	—	—	—	—	—	—	.10	1	2,291
Emergency Enforcement Actions	—	—	—	—	—	—	.15	1	3,437
Actions Initiated Against Major Sources	—	—	—	—	—	—	1.79	31	41,017
Total	.69	100	13,127	.49	53	9,558	2.69	80	61,640

Source: State of North Carolina, Department of Natural Resources and Community Development, Division of Environmental Management, Program Plan (FY 1977, 1978, 1979).
Budget estimates by Booz, Allen & Hamilton

mits, and SOCs. Second, the detection and processing of the latter types of violations is more time-consuming than the former. Third, the agency may initiate more new actions in FY 79 than in previous years but not complete those actions until subsequent fiscal years.

* * * *

The remaining chapter of this report presents a preliminary assessment of the pre- and postcompliance phase programs described in this chapter. After providing an overview of the agency's general strengths and weaknesses, the chapter provides individual program assessments.

VI. PRELIMINARY FINDINGS

The review of state level precompliance and postcompliance air quality programs shows that the Division of Environmental Management, the state unit charged with the day-to-day implementation of source specific emission control requirements, appears to have sufficient tools with which to promote continuing source compliance. The data suggests, however, that the agency may not use these tools in the most effective manner. This chapter, therefore, presents a preliminary evaluation of the state program's principal strengths and weaknesses. It is divided into three parts:

- General findings
- Precompliance program findings
- Postcompliance program findings.

The Task III final report will reassess and refine these findings based on the data collected in Task II on source performance and source/agency interactions.

1. GENERAL FINDINGS

The objective of this section is to provide an overall evaluation of North Carolina's stationary source control programs, in terms of the programs' critical strengths and significant weaknesses. Therefore, it discusses those characteristics which cut across discrete programs. The subsequent two sections on precompliance and postcompliance programs contain program specific evaluations.

(1) Critical Strengths

According to the air programs and enforcement staffs of EPA Region IV, the North Carolina air pollution control program historically has been one of the best state programs in the region. The program characteristics cited by the Region IV staff as those resulting in a particularly strong program are:

- Excellent intergovernmental relationships
- Agency rapport with sources
- Technical expertise.

In the area of intergovernmental relationships, the staff of the Air Quality Section has had good working relationships with both the EPA Region IV staff and the staffs of the local programs. It has worked closely with the staff of the Region IV air programs branch in preparing the emissions inventory and SIP revisions and has consulted with the regional EPA enforcement staff during the preparation of consent orders. In addition, as described in Chapter III, the Air Quality Section has exercised close supervision of local programs. For instance, a member of the monitoring staff has had responsibility for holding meetings every other month with representatives of both the fully and partially certified programs. During these meetings, the state representatives have provided guidance to the local agency staffs on a variety of subjects such as ambient monitoring, inspections, and stack testing.

A second strength of the North Carolina program is the good rapport the DEM apparently has enjoyed with the sources. This good agency-source relationship probably results from two factors. The first factor is the division of responsibility for permit renewals, source surveillance, and consent order development among the seven DNRCD regional offices. Specifically, each regional staff appears to have developed a familiarity with the operating characteristics and problems of most sources within its jurisdiction. Often source managers have consulted with the regional staff in completing permit applications and developing control strategy plans. According to state officials, as a result of this close interaction, sources generally are responsive to regional requests for control improvements. Another factor appears to have been the DEM's policy of promoting voluntary compliance. As a result of this policy, staff members have provided significant amounts of technical assistance to sources in developing control strategies.

The third overall strength cited by EPA staff members is the technical expertise exhibited by the staff. In general, according to those interviewed, the staff members of the Air Quality Section appear to have a good understanding of the state's air pollution control programs, and their technical capabilities are continually expanded through ongoing technical training. Supervisors annually prepare professional development plans for each staff member which typically specify the seminars or other training activities to be undertaken.

Headquarters and regional staff members may take up to three to four courses per year at EPA's Research Triangle Park facility. In addition, each staff member must attend the agency smoke school to become certified in visible emissions evaluations and must renew the certification every six months. Both EPA regional staff and Air Quality Section supervisory staff believe that the emphasis on continuing education has resulted in a professional staff well versed in the problems of stationary source control and able to assist the sources in devising technical solutions to noncompliance problems.

(2) Significant Weaknesses

The positive characteristics cited above are offset by agency administrative problems. A major problem is the inadequacy of recordkeeping practices documented in Chapter III. In general, data on both agency and source activities is incomplete, inconsistent, inadequate, and often difficult to access. The lack of historical budget data and actual expenditure data by program element is one example. A second example is the inconsistency between reports to EPA and internal card files, notebooks, logs and reports. The result is that the historical recordkeeping practices are insufficient to provide the staff with an accurate day-to-day picture of the status of source compliance and the effectiveness of agency actions.

A second set of administrative problems reflects the multilayered structure of the air pollution control program. One example is the relative autonomy of the regional offices. Despite the strength the regional structure provides in facilitating agency/source rapport, it also has the potential for creating inconsistency. In particular, there is a potential for each regional staff to develop its own working definition of compliance, and, as noted above, some staff members will record sources marginally out of compliance as being in compliance if they are located in sparsely populated regions with good air quality. A second example is the decentralized organization of enforcement activities which historically has left the initiation of enforcement up to each regional staff. The third, and final, structural difficulty involves the role of the EMC. The Commission must approve certain DEM actions, such as issuance of consent orders, and the crowdedness of the EMC agenda sometimes results in consent order decisions being held over from month to month.

2. PRECOMPLIANCE PROGRAM FINDINGS

This section provides an assessment of the strengths and weaknesses of each of the precompliance programs described in Chapter V, except for the pre-1970 program. The changes to that program reflected the new requirements set forth in the CAA 1970 and resulted in the first comprehensive effort in the state to control stationary source emissions.

(1) The Emission Inventory

Present practices regarding the updating of the emission inventory illustrate the agency's awareness of problems in their initial efforts. These problems were twofold. First, as described in Chapter V, the initial compilation of the inventory was incomplete and inaccurate. Specifically, the agency did not have follow-up communication with stationary sources not responding to the mail survey. In addition, the agency used only gross estimates of emissions from transportation activities. Today, by contrast, the North Carolina Department of Transportation calculates vehicle miles travelled (VMT) for the agency to provide a more accurate inventory of motor vehicle emissions. In addition, the large regional staff permits the agency to more thoroughly follow up with any nonrespondents to new surveys and to keep track of new facilities and major modifications.

(2) Emission Standard Development

The relatively low rate of industry's challenge of emission regulations and the absence of a challenge by environmental groups suggests that the promulgation procedures and the standards themselves are satisfactory. The only emission standard which appears to pose a problem is one for the woodworking industry. EPA Region IV staff has refused to issue notices of violation to violators on the grounds that the regulation is ambiguous. The staff of the Air Quality Section takes the position that it has drafted and disseminated an interpretation, described in Chapter IV, and that if EPA feels the regulation is inadequate it should issue a notice of SIP deficiency.

Agency officials pointed out that any problems they encounter in promulgating adequate regulations are only partially internally generated. In some cases, they reflect uncertainty over EPA policies and requirements. As EPA Region IV has noted, the DEM staff has a good record of meeting deadlines for SIP revisions and promulgation of regulations. In fact, North Carolina officials point out that at least in the case of complex sources, they were so responsive to indications that EPA would require such a regulation, that the EMC promulgated one in 1976. However, EPA ultimately decided not to promulgate complex source regulations, a fact which promoted some controversy between DEM and regulated sources.

(3) Control Strategy Testing

Like other states, North Carolina's control strategy was based largely on the model region approach. As noted in Chapter IV, North Carolina contracted for extensive modelling of the Charlotte region. The modelling was based on emissions inventory and meteorological data. Given this model region approach, together with inaccuracies in the early inventories, it would be reasonable to conclude that for some regions in the state the emissions regulations promulgated might have been stricter than what would have been required to meet ambient standards. This seems particularly possible given the fact that North Carolina has relatively few nonattainment areas.

It is important to note, however, that an important test of whether the control strategy testing resulted in unrealistically strict regulations is the extent to which industry has challenged the validity of the regulations or petitioned for source specific control strategy changes. The data reported in Chapter IV suggest that in only a few cases has industry mounted a forceful regulatory challenge. Apparently, these challenges all have been resolved in some manner by the EMC and never have reached the litigation stage. Of course, one possible explanation for the lack of challenge to the regulations is industry's role, through its representation on the Air Quality Council, in promulgating the regulations.

(4) Permit Preparation

The permit program, which since 1973 has applied to both existing and new sources, appears in general to be well organized and administered. The regional staffs have provided technical assistance to source staffs in preparing control plans. In some cases, this assistance probably has assured the source that its permit application will be approvable, and, in fact, Chapter V illustrates that in the past five years, the DEM director has denied only 11 applications. As required by law, all sources subject to PSD and NSR regulations also are subject to modelling to determine the impact of their operations on ambient air quality. The agency also conducts ambient impact modelling for existing sources upon the recommendation of the regional engineer. In addition, a headquarters review engineer conducts an engineering evaluation of the sources' proposed control plans to determine whether the source will be able to meet emission standards. This evaluation may include independent calculations of the sources' uncontrolled emissions and a review of suppliers' specifications and operating literature in order to calculate emissions after control.

These strong points are offset by two problems. The first problem is that in the past there appears to have been at least one occasion when both the agency and the sources were unaware of a significant statutory change on permit requirements. This occasion was the 1973 amendment extending the permitting requirement to existing sources. One result has been that the agency never has entirely caught up with its expanded responsibilities. Specifically, as noted in Chapter V, approximately one-third of all minor sources required to have permits do not have them, principally because they have not applied, even though the agency has a policy of soliciting applications from all unpermitted sources. The fact that these sources do not yet have permits poses a second problem for the agency, namely that the staff is probably unaware of the compliance status of many of these sources. Although the staff is supposed to inspect all sources, even those without permits, the incentive clearly is to monitor those sources with permits.

(4) Surveillance and Monitoring

This program is characterized by neither strengths nor weaknesses. In fact, the program is very small, applying only to those sources which have received permits of a temporary nature. For those sources, regional office staff members conduct periodic inspections to ascertain whether the source is meeting the increments in its compliance schedule. According to interview data, this surveillance receives high priority. The agency does not monitor sources which have received final operating permits prior to construction. Rather, these sources are required to demonstrate compliance as described in the next section. Overall, the surveillance effort during precompliance is adequate.

3. POSTCOMPLIANCE PROGRAM FINDINGS

This section provides an assessment of the strengths and weaknesses of postcompliance programs.

(1) Demonstration of Compliance

The agency's program for source demonstration of compliance appears to be sound. All sources are subject to an agency conducted engineering evaluation to ascertain that the process characteristics are those specified in the permit application and that the source has installed and put on line the required control devices. In some cases, the engineering evaluation accompanies either a source test or a visible emission evaluation. A strong point of the program is that the agency has its own source testing capability and therefore conducts its own source test if the source submits an unsatisfactory report.

(2) Surveillance and Monitoring

The previous chapter shows that the agency utilizes several surveillance and monitoring methods. Agency staff have technical capability in fuel analysis, visible emissions evaluation, and source testing, all of which are strengths. In addition, the agency conducts a multifaceted and well administered Region IV staff. As noted previously, each regional office develops an inspection schedule at the beginning of the fiscal year. Based on the size and past performance of a source, the source may be scheduled for annual, biannual, or quarterly inspections. In addition, the agency conducts follow-up inspections in any cases where violations are detected. The formal inspection typically is preceded by a visible emissions test. Since regional engineers and technicians develop extensive familiarity with the sources within their jurisdictions, they easily can spot changes in the operation and maintenance of the facility's control equipment. Thus, the inspection is a critical method for detecting emissions violations. Occasionally, as a result of an inspection, a regional office may require the source to conduct a source test or may request the source testing group to conduct the test. Except in rare cases, site inspections are unannounced, thus precluding a source manager from hastily changing operating conditions. However, while the inspection visits are unannounced, the inspections are not conducted without the source manager's knowledge. Agency staff members stated that to encourage maximum cooperation from the sources, the inspector goes to the plant's reception area, states the purpose of the visit, requests to speak with the manager, and asks the manager to·participate in the inspection tour if he desires.

These strengths are partially offset by some apparent problem areas. First, the agency does not inspect all approximately 12,000 major and minor sources each year. Second, of those sources inspected, relatively few receive more than one inspection, unless the first inspection revealed a violation or near-term potential for one. Third, few sources have continuous monitoring equipment or any kind of emission data. Fourth, even the process data at many sources is incomplete. These factors most likely result in the agency not having an entirely accurate picture of the frequency of excess emissions. Part of Task II will be to uncover those excursions into noncompliance of which the agency most likely is unaware.

(3) Permit Renewals

The permit renewal program appears to be well structured and administered. Its principal strength is that for all sources on permits it provides an additional, periodic (every 3-5 years) check on a sources' compliance status. Sources which have modified their operations significantly must file for new permits, and sources out of compliance with their emission limits receive either denials or short extensions until the violation is corrected. As Chapter V showed, during a sample one year period, the agency approved 89 percent of the renewal applications, granted short extensions in 3.6 percent of the cases, and of the remaining 7.4 percent held several until the staff could conduct the required inspection. The staff conducted those inspections the following year, and the agency has not compiled data on the results of those applications.

(4) Enforcement Strategies

The principal characteristic of enforcement policy and strategy in North Carolina has been that neither the Air Quality Section nor the Enforcement Office has taken an aggressive posture. The policy stated in the SIP and reiterated during interviews is to explore every possible avenue of voluntary cooperation before imposing penalties. Both regional and headquarters staffs appear to have implemented this policy consistently. In addition, no evidence exists to suggest widespread source refusal to correct agency detected violations. The staff of EPA Region IV, in fact has cited the regional staff's ability to work with the sources in correcting violations as one of the program's principal strengths. Furthermore, neither the decentralized approach to enforcement, which splits responsibility among the regional air quality staff, the headquarters air quality staff, and the enforcement staff, nor the infrequent use of penalties appears to have stymied agency efforts to foster continuing compliance. Therefore, any problem the agency might have in fostering continuing compliance is more likely attributable to insufficiencies in detecting violations than in pursuing correction of detected violations.

APPENDIX A

The appendix contains the names and positions of North Carolina and EPA Region IV officials interviewed during the conduct of Task I. The interviews with EPA Region IV staff members were conducted in person on July 26, 1978. Both personal and telephone interviews with North Carolina officials were conducted during the periods July 24, 1978 to October 19, 1978, and December 1, 1978 through February 1, 1979.

1. EPA REGION IV STAFF INTERVIEWED

Wayne Aronson, Air Enforcement Branch

Ray Cunningham, Air Programs Branch

John Johnson, Chief Air Attorney, Legal Group

Floyd Ledbetter, Air Enforcement Branch

2. NORTH CAROLINA OFFICIALS INTERVIEWED

Michael Aldridge, Source Testing Group, Air Quality Section

Craig Bromby, Office of Enforcement

Kirt Cox, Office of Enforcement

Wells Garden, Data Systems Coordinator

Russ Hageman, Analysis and Review Group, Air Quality Section

Derr Leonhardt, Plans Review Group, Air Quality Section

David Ligon, Permits and Field Operations Chief, Air Quality Section

James McColman, Air Quality Section Chief

George Murray, Monitoring Unit, Air Quality Section

Brock Nicholson, Technical Services Chief, Air Quality Section

Dan Oakley, Attorney General's Office

Glenn Ross, Monitoring Chief, Air Quality Section